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ZOOPLANKTON DENSITY OF LONI DAM WATER, KINWAT,
DIST- NANDED, MAHARASHTRA (INDIA).



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Short Profile

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ABSTRACT:

In the present investigation was undertaken to study of the physico-chemical parameters with relation to the zooplankton composition in Loni dam water. The physico-chemical parameters of Loni Dam water were found favorable range for the growth of the zooplankton. The present investigation the three spots were selected for the study and named as Sites I, II and III respectively. The study carried out the one year during the June- 2012 to May-2013. The dominant trend in the zooplankton was Rotifera > Cladocera > Copepoda > Ostracoda and total count of zooplankton was 12 to 30 number/lit at Site- I, 11 to 50 number/lit at Site- II and 13-43

number/lit at Site- III. The physicochemical parameters are favorable range for the growth of zooplankton and it may be beneficial for the fish culture.

KEYWORDS

Zooplankton, Physico-chemical parameters, Loni dam water.

INTRODUCTION :

Loni reservoir is a medium project. It is used for irrigation, drinking and for fish production. It exhibits diversity zooplankton. The study of biological parameters i. e. plankton is important component of dams and reservoirs. The study of plankton gives their number, kinds and occurrence in a reservoir and dams. The planktons are of two types phytoplankton and zooplankton. They serve as food for many aquatic animals especially fishes and play key role in maintaining proper equilibrium between abiotic and biotic components of the reservoir. Plankton encountered in the reservoir reflect the average ecological condition and therefore, they may be used as indicator of water quality. Hence the studies of plankton are taken for investigation as the growths of fishes are totally depends on availability of plankton population. Zooplankton invariably forms an integral component of freshwater communities and contributes significantly to biological productivity. These fish-food organisms have been studied from various inland ecosystems of this country but information on their ecology in the Indian floodplain lakes in particular is yet limited (Sharma & Sharma, 2008). The related contributions from northeast India are by Sharma and Hussain (2001), Sharma (2011), Sharma and Sharma (2011). The present study, on diversity of zooplankton of two floodplain lakes (commonly called 'pats') of Manipur, assumes limnological importance in view of the stated lacunae. The observations are made on monthly variations of richness and abundance of zooplankton.

MATERIALS AND METHODS

Monthly sampling was conducted around one year of study from three different Site- I, II and III respectively during the June 2012 to May 2013. The collections of samples were done from subsurface. For collection of large water (one liter) was sieved through plankton net. A simple type of plankton net was used. The sample was collected for zooplankton. Collection of zooplankton concentration was made and preserved in 4% formalin solution. The qualitative and quantitative analysis of zooplankton was done with the help of sedimentation cell and zooplankton identification is done by following systematic keys of Pennak (1978), Edmondson (1992), Battish (1992) and Altaff (2004), Adoni et.al (1985).

Table No. 1. Composition of zooplankton density in Loni dam at Site- I (Numbers/liter)

Zooplankton	Rotifera	Cladocera	Copepoda	Ostracoda	Total Zooplankton
Months					
Jun-12	14	24	20	19	77
July	12	25	22	14	73
August	15	22	22	16	75
September	15	27	16	14	72
October	22	19	16	12	69
November	29	17	19	10	75
December	22	24	20	12	78
Jan-13	25	26	19	12	82
Feburary	24	18	12	20	74
March	26	12	15	19	72
April	25	19	10	18	72
May	30	20	16	12	78
Total	259	253	207	178	897
Total Mean	21.58	21.08	17.25	14.83	74.75
Percentage	28.87	28.20	23.07	19.84	100.00

Table No. 2 Composition of zooplankton density in Loni dam at Site- II (Numbers/liter)

Zooplankton	Rotifera	Cladocera	Copepoda	Ostracoda	Total Zooplankton
Months					
Jun-03	27	34	17	19	97
July	27	36	19	22	104
August	30	33	19	24	106
September	42	40	25	24	131
October	33	35	18	14	100
November	37	35	20	15	107
December	40	28	19	22	109
Jan-04	38	35	22	18	113
February	44	24	18	10	96
March	46	29	19	12	106
April	48	27	19	14	108
May	50	32	20	11	113
Total	462	388	235	205	1290
Total Mean	38.5	32.33	19.58	17.08	107.5
Percentage	35.81	30.07	18.21	15.89	100

Table No. 3 Composition of zooplankton density in Loni dam at Site- III (Numbers/liter)

Zooplankton	Rotifera	Cladocera	Copepoda	Ostracoda	Total Zooplankton
Months					
Jun-03	22	28	25	21	96
July	24	32	28	24	108
August	18	28	25	20	91
September	28	23	29	26	106
October	26	17	16	23	82
November	29	18	18	22	87
December	32	19	19	18	88
Jan-04	22	24	22	26	94
February	35	15	15	19	84
March	36	18	16	18	88
April	34	13	15	17	79
May	43	22	19	22	106
Total	349	257	247	256	1109
Total Mean	29.08	21.41	20.58	21.33	92.41
Percentage	31.6	23.17	22.27	23.08	100

Fig No. 1 showing the zooplankton density of Site- I (Numbers/liter)

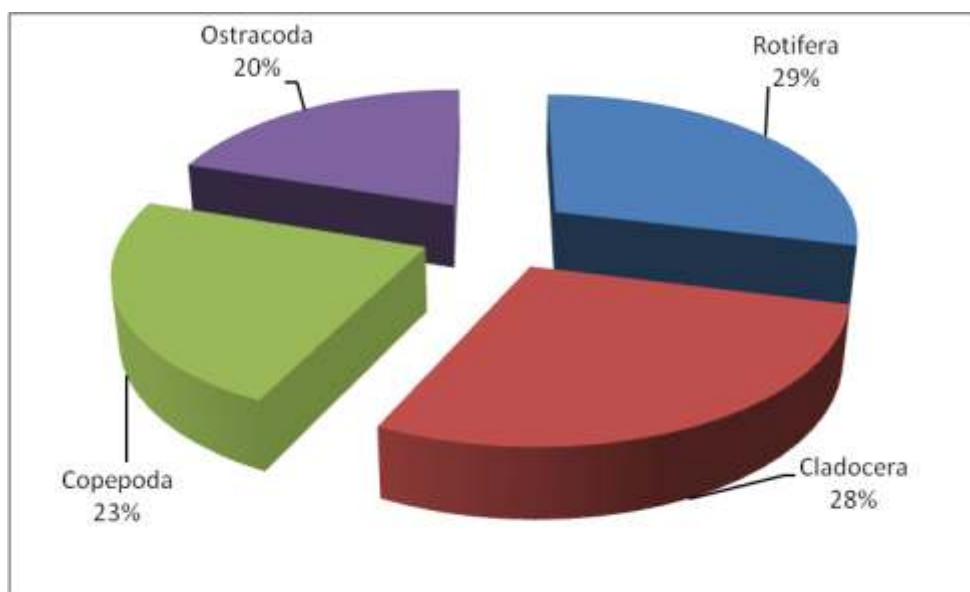


Fig No. 2 showing the zooplankton density of Site- II (Numbers/liter)

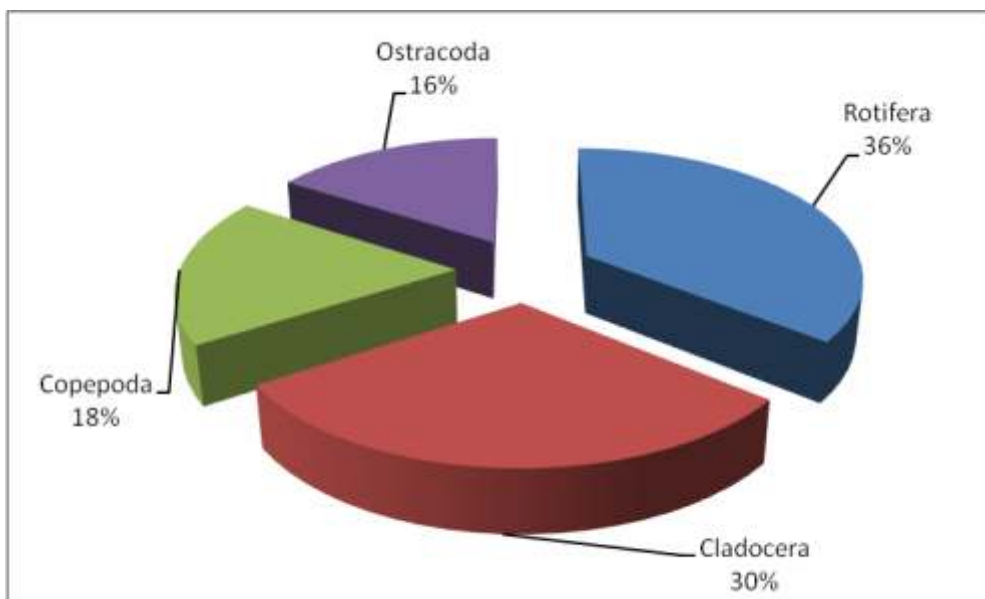


Fig No. 3 showing the zooplankton density of Site- III (Numbers/liter)

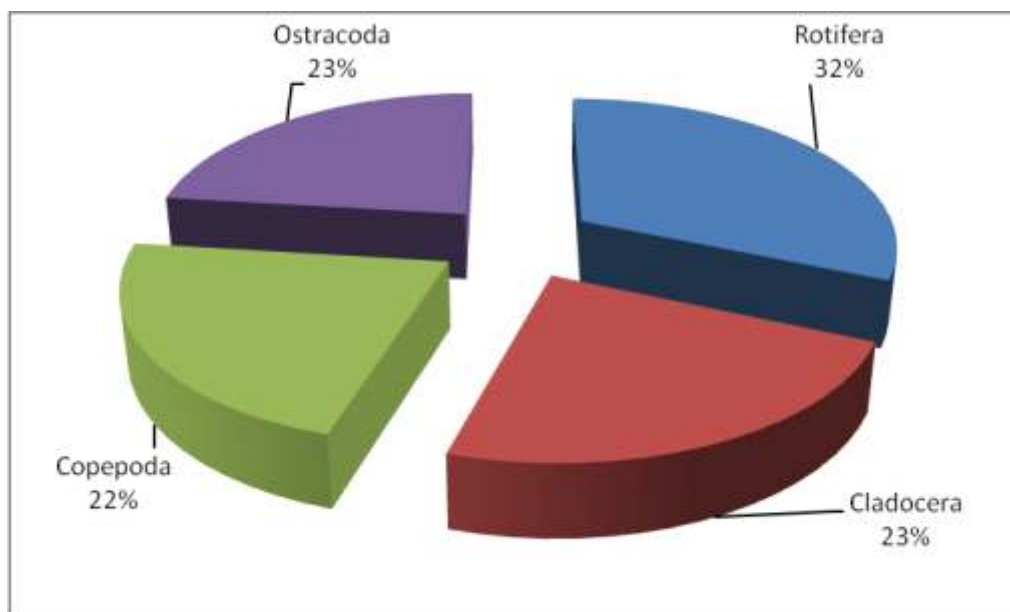


Table No. 4 Range of physic-chemical parameters of Loni dam water.

Sr. No.	Parameters	Range
1	Taste	Acceptable
2	Turbidity (NTU)	74-135 (cms)
3	Water temperature	22.1 - 38.8 (°C)
4	pH	7.3-8.7
5	Conductivity (mhoms)	221-313
6	Free Co ² (mg/l)	1.1-3.9
7	Total alkalinity (mg/l)	98-157
8	Chloride (mg/l)	9.94-36.92
9	Total hardness (mg/l)	85-136
10	Calcium hardness(mg/l)	40-93
11	Magnesium hardness (mg/l)	3.20-12.11
12	TDS (mg/l)	90-395
13	Sulphate (mg/l)	9-19
14	Phospate (mg/l)	0.07-0.48

RESULTS AND DISCUSSION

In the present investigation the zooplankton community, rotifera ranges between 12 to 30 number/lit at Site- I, 27 to 50 number/lit at Site- II and 18 to 43 number/lit at Site- III. Cladocera ranges between 12 to 27 number/lit at Site- I, 24 to 40 number/lit at Site- II and 13 to 28 number/lit at Site- III. copepoda ranges between 12 to 22 number/lit at Site- I, 17 to 25 number/lit at Site- II and 16 to 29 number/lit at Site- III. Ostracoda ranges between 10 to 20 number/lit at Site- I, 11 to 24 number/lit at Site- II and 17 to 26 number/lit at Site- III. The monthly variation of zooplankton is represented in table no. 1, 2, 3 and graphically represented in fig no. 1, 2, 3 respectively. The zooplankton population in Loni dam water was composed of four major groups namely Rotifera (32.09%) Cladocera (27.35%), Copepoda, (21.18%) and Ostracoda (19.60%). The present investigation Rotifera was the dominant group at three sites of the Loni dam. The peak of the zooplankton density in Loni dam water recorded in April and May months. Rotifer richness and its biodiversity were found to be maximum in summer in Loni dam indicating the influence of temperature which was supported by direct relation between summer temperature and Rotifera population. This observation is in concurrence with work of Kaushik and Sharma (1994) and Singh (2000) who have studied Zooplankton population in Malsya Sarovar Gwalior and in tropical lake respectively. The number of Rotifers increased in summer which may be due to the higher population of bacteria and organic matter of dead and decaying vegetation (Majagi and Vijaykumar, 2009). Segers (2003) highlighted the dominance of rotifer population which was due to its preference for warm waters. Planktonic rotifers have a very short life cycle under favorable conditions of temperature, food and photoperiod. Since the rotifers have short reproductive stages they increase in abundance rapidly under favorable environmental conditions (Dhanapathi, 2000).

The maximum population of cladocera in summer may be attributed to favourable temperature and availability of food in the form of bacteria, nanoplankton and suspended detritus. While in monsoon the factors like water temperature, DO and Turbidity play an important role in controlling the

diversity and density of cladocera (Edmondson, 1965; Baker 1979). Abundance has also been earlier reported in monsoon season and lower in summer by Pawar and Pulle (2005) in Pethwadaj dam of Nanded district. The copepod population in Loni dam water is due to richness of organic matter. Similar observations were also made by Somani and Pejaver (2004) in Lake Masunda. Similar result has also been observed by Sukand and Patil (2004) in Fort Lake of Belgaum and Kedar et al. (2008) in Rishi freshwater lake of Washim district.

Among all the zooplankton, rotifer has maximum diversity and population density in all the seasons. The dominance of rotifers in the lake was due to the continuous supply of food material which in turn indicates the eutrophic nature of the lake (Sukand and Patil, 2004) and that of Sona Dighi reservoir (Naz and Najia, 2008). Average number of Copepods were noticed during monsoon and winter, but were too less in summer season. As compared to rotifera and copepoda, population density of Cladocera and Ostracoda was very low in all the seasons and they did not show the remarkable seasonal fluctuation. Similar observations have been made by Das (2002). Primary production is responsible for increasing the population density of zooplanktons in summer season. Normally monsoon is associated with lower population densities due to its dilution effect and decreased photosynthetic activities by primary production.

CONCLUSION:

In conclusion, the zooplankton rotifera appeared to be most dominating community throughout the study period. Overall Zooplankton population fauna of the reservoir was much more diversified indicating the Loni dam as nutrient rich water body which is useful for the fish culture. It may be undergo the state of eutrophication, if not managed properly. In this study, all over population of zooplankton was high in summer and winter season; and low in monsoon season. Copepods and rotifers were dominated over Cladocera and Ostracod by population throughout the year.

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