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RESEARCH ARTICLE **OPEN ACCESS**

Seasonal Distribution of Zooplankton in Nal Damayanti Sagar.

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ABSTRACT

Seasonal distribution of Zooplankton was categorized under six group in the order as, Rotifer > Cladocera > Copepoda > Protozoa > Ostracoda > Worms & Larvae. Zooplankton diversity was studied from this project which is one of the most ecological parameters as these are the intermediate link between phytoplankton and fish. They play a significant role in transferring energy in aquatic ecosystem as primary consumers and can be used as indicators of tropic phase of a water body. Seasonal trend in Zooplankton population was observed maximum during summer month and minimum in monsoon.

Keywords: Zooplanktons, Diversity, Rotifer, Seasonal trends.

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INTRODUCTION

Water is the most precious natural vital resource and one of the principle elements of nature, importance of which in human civilization needs no elaboration. It is a renewable resource and important factor for maintaining balance in the nature. Its physical and chemical properties support the biological cycles of the livings and control the climatic and geological conditions everywhere.

The water as food and raw material is strictly connected with life and describes the human cultural development throughout the centuries.

The inland water resources, on the surface of Earth such as rivers, lakes, reservoirs and ponds became the focus of special attention in the early stage of development of the science of ecology. The water as food and raw material is strictly connected with life and describes the human cultural development throughout the centuries. Better Quality of water Described by its Physical, Chemical and Biological Characteristics. For effective maintenance of water quality through appropriate control measures, continuous monitoring of large number of quality parameters is essential.

The zooplankton occupies an intermediate position in the food web in the aquatic ecosystem. Nearly all fish depend on zooplankton for food during their larval phases, and some fish continue to eat zooplankton in their entire lives (Madin et.al.[1] According to Murugan et.al.[2] and Dadiuch and Saxena [3] the zooplankton play an integral role and serves bio indicators and it is a well -suited tool for understanding water pollution status(Ahmad,1996;Contreas et.al.2009).[4-5] Therefore the present study is under taken considering interrelation ship between abiotic and biotic components, monthly and seasonal impact with Zooplankton dynamics.

METHODOLOGY

'Nal Damayanti Sagar' is a perennial dam, constructed by irrigation department of Maharashtra government,in Amravati District of Maharashtra,is also known as the Upper Wardha Project situated 56 Km from the district place Amravati (M.S). The water of dam is used for drinking, fishery and irrigation purposes along with some domestic activities It is an earthen reservoir with the height 36M and 7Km long spread area accuping the border of Amravati and Wardha district for the purpose of irrigation and drinking water supply. The dam is constructed on Wardha river, it is at 780-03'-27" E longitude and 210-16'-18" N latitude. The catchment area is 4302 Sq. Km. and located at 306 MSL.

For the investigation of various abiotic and biotic parameters five different sampling stations were selected(Fig:1). Monthly samples were taken in two liter polythene bottle at regular interval in between 9-11 am. The samples were analyzed for abiotic components at laboratory condition and the filtrate were fix in 4% formalin for the enumeration of zooplanktons. The method used for the physico-chemical analysis of water and identification of zooplankton as given by APHA[6]), Adoni[7] and Great lake water life photo gallery.

RESULTS AND DISCUSSION

Station wise enumeration of total zooplanktons exhibited highest number of total zooplanktons at station I followed by station II, station IV, and station III however, at station V, the total zooplanktons were found to be the minimum. The zooplankton population were five orders namely, Rotifera,Cladocera, Copepoda, Osracods, Larvae and Protozoan. A total of 56 zooplankton genera under the five orders were recorded from the study stations. Among the collected planktons the order Rotifera(27.90%) was dominant followed by Cladocera(16.76%), Copepod(15.49%), Protozoans(15.06%),Ostracods(13.28%) and Worms and Larvae(11.52%). The present study exhibits higher magnitude of zooplankton during summer season(April,May and June).

Seasonal and numerical variations in zooplankton abundance is shown in table-1,fig-2 and table-2,fig-3. Abundance in zooplanktons was in the order of rotifers > cladocera > copepoda > protozoa > ostracods > worms and larvae. Seasonal trend of zooplankton representing lower number in monsoon season. It might be due to rain water, causing diluting effects as suggested by Chapman et.al.[8] On the other hand zooplankton might have consumed by fishes as reported by Dave

et.al.[9] The increased turbidity in rainy season may be the cause for declining zooplankton population as suggested by Sharma and Sahai .[10] Similarly higher population density of zooplankton during summer season can attributed to low water volume and increased nutrient concentration, Rich biotic community in the water of Nal Damayanti Sagar investigated in the present study is healthy practice for fish culture as noted from fish catches.

Table1: Seasonal trends of zooplankton population(Org/l) of Nal Damayanti Sagar.

Sr.No.	Zooplanktons	Monsoon	Winter	Summer
1	Rotifers	3284	3284	5169
2	Cladocera	1900	2195	3005
3	Copepoda	1900	2209	2555
4	Protozoa	1708	1974	2695
5	Ostracoda	1644	1753	2268
6	Worms&Larvae	1433	1325	2070
	Total	**11869**	**12739**	**17761**

Table2:Numerical abundance of zooplankton(org/l)at different stations of Nal Damayanti Sagar during 2013-2014

Sr.No.	Zooplanktons	Stations					Total	%
		I	II	III	IV	V		
1	Rotifera	14801	13917	14654	15316	14138	72826	27.90
2	Cladocera	9646	9646	10383	7879	6185	43740	16.76
3	Copepoda	8026	9205	6480	9205	7511	40426	15.49
4	Protozoa	8542	5670	9205	7437	8468	39322	15.06
5	Ostracoda	8247	8395	6185	5913	5913	34653	13.28
6	Worms&Larvae	5766	6775	4345	7585	5596	30066	11.52
	Total Zooplankton	**55028**	**53607**	**51251**	**53335**	**47812**	**261034**	**100**

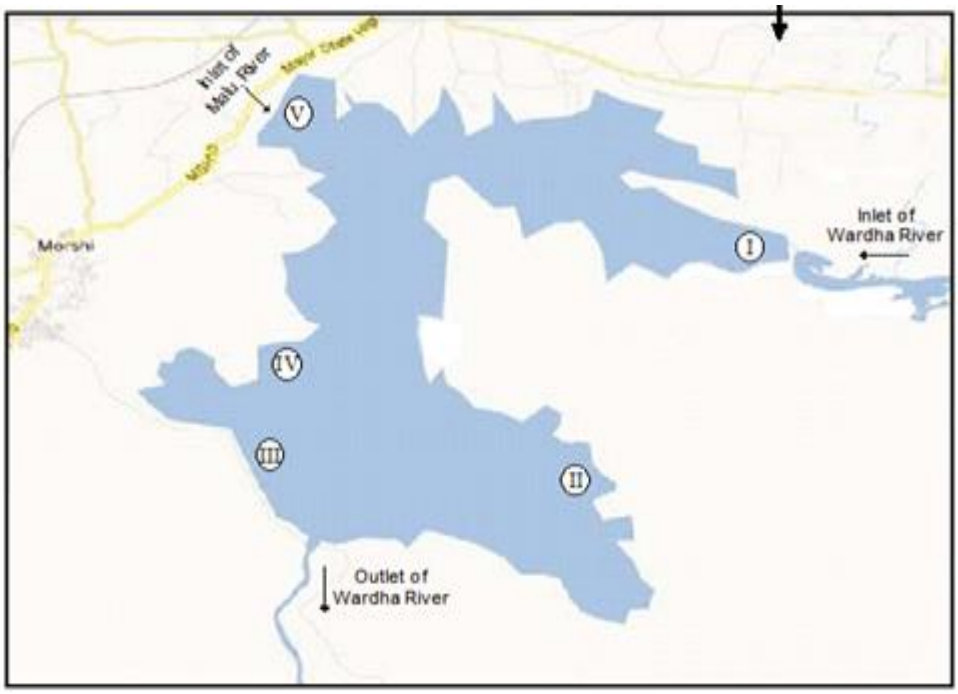

Fig1.:Photograph showing Sampling Station I to V of Nal Damayanti Sagar.

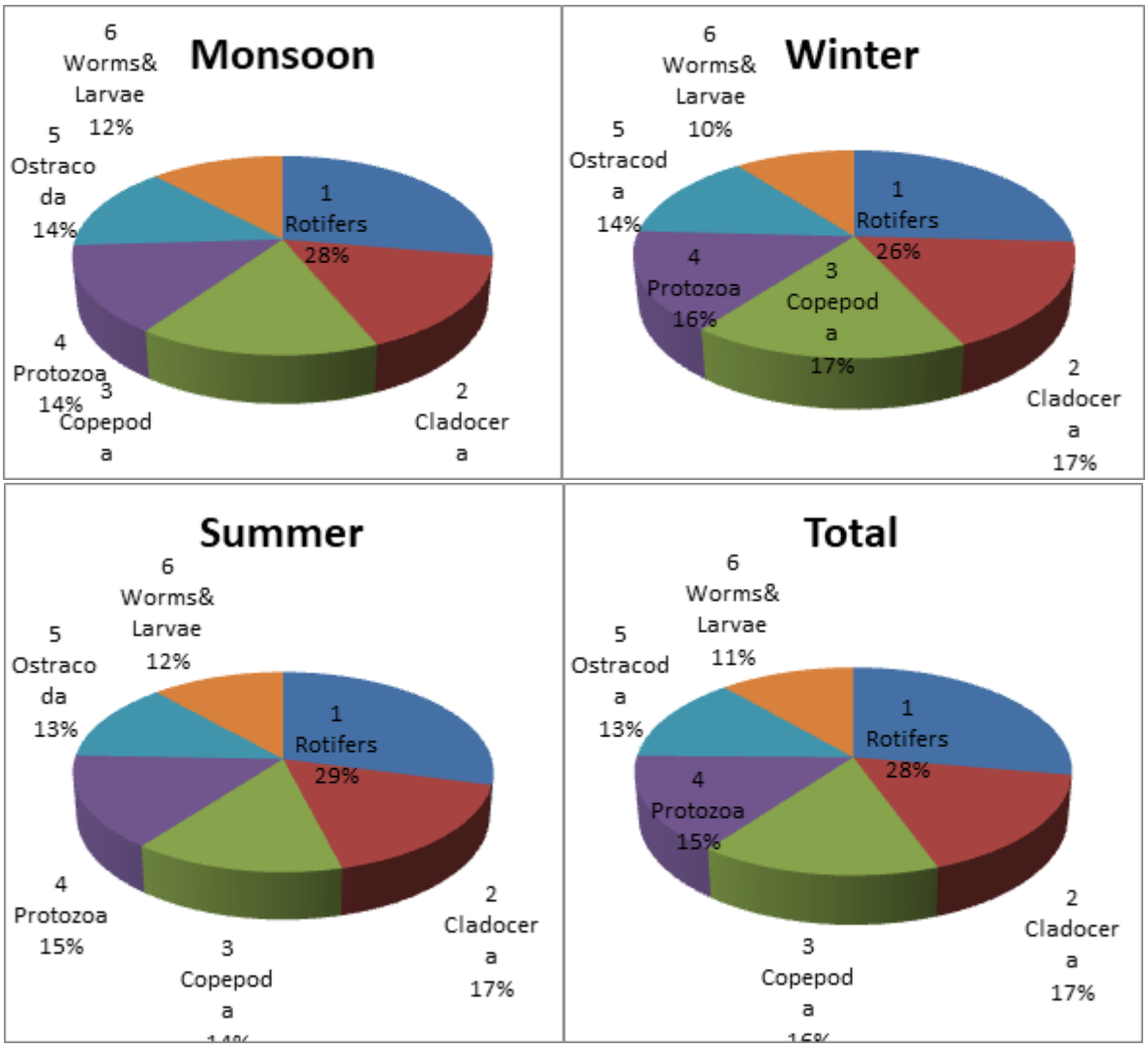

Fig2: Percentage of Seasonal Population of zooplankton in Nal Damayanti Sagar.

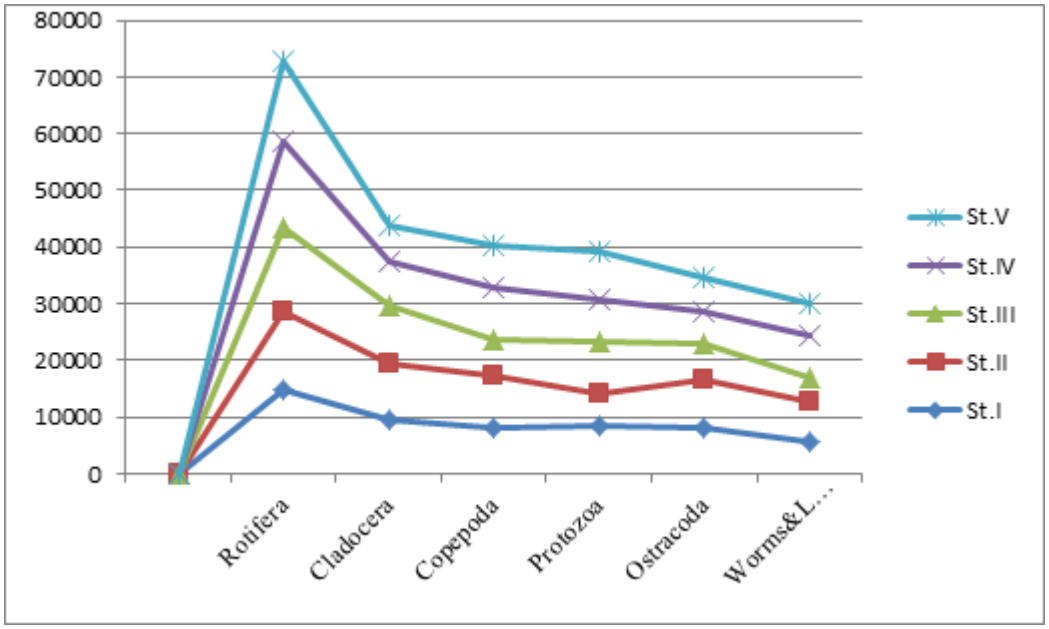

Fig3:Station wise quantitative distribution of Zooplankton from Nal Damayanti Sagar 2013-2014

CONCLUSION

The planktonic population varies qualitatively and quantitatively depending on the morphometry, source of water, its organic and inorganic content, climatic factors and with the season Zooplankton population belongs to six category exhibit more population of rotifers in the present investigation which is good food for the fishes therefore, the water body is advantageous for fish culture. The presence of water insects, mollusks, macrophytes, provides food for migratory and residential birds. The pollution indicator phytoplankton and zooplankton were less in number at all the station confirms that the water is safe for drinking and also for healthy fish culture. The present status of water body is mesotrophic and nonpolluted hence; the water can be utilized for irrigation, drinking and fishery activities.

Conflicts of interest: The authors stated that no conflicts of interest.

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