

Studies on Composition of Zooplankton in Bindusara River Water at Beed, Dist Beed, Maharashtra, India

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Abstract: The present study deals with the zooplankton composition of Bindusara river water. Physico-chemical parameters. Bindusara river water was favourable for growth of zooplankton. Fresh water zooplankton is an important component of aquatic ecosystem. They play a very important role in Fresh water ecosystem the zooplankton community was maximum in summer season & minimum in monsoon due to high temperature and low turbidity in summer season & vice-versa. The zooplankton composition is reported by all groups viz. Rotifera, cladocera, copepoda & ostracoda. The dominant trend of zooplankton in the present investigation is-- Rotifera > cladocera > copepoda > ostracoda.

Key Words: Bindusara River, zooplankton, physico-chemical parameters, Rotifera, Cladocera, Copepoda, Ostracoda

Introduction:

In aquatic ecosystem zooplankton is an important component. It plays a vital role in aquatic food chain primarily; the physical chemical environment shapes their community structure (Hutchinson 1967). It is influenced by biological competition for food resources and predation (Sampio et al 2002, Naves et al 2003). According to Blancher, 1984 the zooplankton community composition & structure is affected by eutrophication (Vandysch 2004, Webber et al 2005). In India various ecological aspects of zooplankton have been studied by researchers, Ansari (1993) Chandrasekhar and Kodarkar (1995), Rekha Sharma & Diwan (1997) Malathi, Wagh (1998) Annapurna Balamurugan et al (1999), Hessen Hujare (2005). Like other biotic factors composition of zooplankton: have been studied by many workers.

Materials and Methods:

For the present investigation three sampling sites were selected i.e. site x, site y, site z. The monthly sample collection for zooplankton analysis was done in every month from the Bindusara dam river at Pali; Beed through one year from June 2019-May 2020 at selected three sampling stations by using plankton net made of bolting silk (mesh 25µm) by sieving known volume of water sample. For identification of zooplankton sample were examined in detail under the microscope with high magnification. Standard literature was used for identification of species (Edmondson, 1959), Michael (1973), plankton sample were fixed in 4% formalin and preserved in 100 ml polythene bottles. The preserved sample were diluted 40ml with distilled water. The zooplankton were identified using methodology by APHA (1981) & Kodarkar (1992) the counting was done by using Sedgwick-Rafter counting cell. 1ml of plankton sample was drawn & transferred to S-R counting cell. The observation was taken under microscope. The procedure was repeated 5 times to get an average population. The identified species were expressed in number/lit (Adani (1985) Dhanapathi (2000) & Batish (1992) The preserved samples were studied for the diversity of zooplankton made the research binocular microscope by using standard keys & literature (Tonay, 1980, Murgan 1998, Kodarkar et al 1998) & Kodarkar et al (2006). In the given table 1 shows physico-chemical parameters and in table 2 shows composition of zooplankton species in Bindusara river water during the year 2019-2020.

Table.1-Physico-chemical parameters of Bindusara dam water

Sr.no	Parameters	Range
1.	Water temp (°C)	18.1 to 32.6
2.	Electronic Conductivity	468 to 985
3.	Total dissolved	293 to 728
4.	PH	7.5 to 8.8
5.	Total Alkalinity (mg/l)	97 to 259
6.	Dissolved oxygen (mg/l)	5.3 to 9.9
7.	Carbon dioxide dissolved (mg/lit)	0.02 to 0.09

8.	Total hardness (mg/lit)	67 to 144
9.	Nitrate (mg/lit)	2.1 to 11.8
10.	Potassium (mg/lit)	0.2 to 2.1
11.	Chloride (mg/lit)	28 to 68
12.	Nitrite	0.3 to 38

Table 2. Table shows composition of zooplankton species in bindusara river water during the year 2019-20

Zooplankton Month	Rotifera	Cladocera	Copepoda	Ostracoda	Total
June-2019	65	54	44	36	199
July-2019	82	75	56	52	255
Aug-2019	87	79	72	54	282
Sept-2019	91	80	65	58	288
Oct-2019	98	85	70	55	308
Nov-2019	102	96	68	53	324
Dec-2019	105	88	66	49	308
Jan-2020	112	84	72	46	314
Feb-2020	120	90	58	45	313
Mar-2020	126	92	55	42	315
April-2020	135	87	59	45	326
May-2020	142	89	51	38	343
Total	1265	999	726	536	3575
Total mean	105.16	83.25	60.5	442.66	297.91
Percentage	35.29%	27.94%	20.30%	14.99%	100%

Result and Discussion:

The monthly variation of physico-chemical parameters and occurrence of zooplankton at Bindusara dam water are given in table 1&2 respectively. In aquatic ecosystem zooplankton play a critical role not only primary consumers but also serve as a source of food for higher organisms. Zooplankton provide main food for fishes & can be used as indicators of the trophic status of water body (Verma & Munshi 1987) Naves I.F. & A.A Pinto (2003) Rao.MB & Muley E.v. (1981). During the investigation on Bindusara river, the monthly variation of rotifera recorded in the range of 65 to 142 number/lit, i.e. 35.29%. The cladocera (27.94%) recorded in the range between 54 to 96 number/lit. Copepoda (20.30%) were from 44 to 72 no./lit. and ostracoda (14.99%) recorded from 36 to 58 number/lit.

The population of zooplankton in Bindusara dam water was composed of major four groups namely- Rotifera (35.29%), Cladocera (27.94%), Copepoda (20.30%), Ostracoda (14.99%) viz; Rotifera > Cladocera > Copepoda > Ostracoda.

It means that the present observation the Rotifera was dominant groups, according to the all groups of zooplankton follows Rotifera, Cladocera, Copepoda, and Ostracoda. Quality of an aquatic ecosystem is depending on the physical & chemical qualities of water and also on Biological diversity of the aquatic system. The species of Rotifera found during the period of investigation the minimum number of rotifera was observed in monsoon and maximum in summer season Singh (2000) Rao M.B. Muley E.V. (1981)

Cladocera popularly observed in the 2nd position. It is preferred to live in deep water. It constitutes a major used as a food for fish. Thus, they play a vital role in food chain and energy transformation Tonapi G.T. (1980) Uttangi J.C (2001) & Vandysh U.I (2004) Wagh N.S (1998)

In the present study the cladocera species ranging from 54 to 96 number/lit during the year 2019-20. The cladocera were minimum in summer season and maximum in monsoon season. The population in cladocerans in different water bodies have been reported by Nayer (1987) Rao & Muley (1981) Mathew (1985) Kaushik & Sharma (1994) & Murgan et.al (1998) Webber Mona, Myers, Elecia Edwards Cambell C & D Webber (2005)

Copepoda

Fresh water Copepods constitute one of the important zooplankton communities occurring in all types of water bodies and ranging from free living to parasitic forms. They serve as food to several fishes and play a vital role in ecological Pyramids. Allen (1976) observed the inverse relationship between high population of Rotifera & Cladocera. In the present investigation Copepoda (20.30%)

species varied from 44 to 72 number/lit. The maximum number of Copepoda were observed during Moonsoon to winter season and minimum in summer season.

Ostracoda:

Ostracodes are small crustaceans having the bivalve carapace enclosing the laterally compressed body. According to Tonapi (1980) the higher population of ostracodes during monsoon may due to the abundance of fine detritus to which omnivorous organisms switch over. During monsoon water temp. & the availability of food organism. May affects the ostracoda population. In the present study ostracoda (14.99%) species varied from 36 to 58 number / lit. the maximum no. of ostacoda were observed during monsoon season & minimum in summer season.

Among all the species of zooplankton rotifera is dominant than cladocera, copepoda and ostracoda. The percentage composition of zooplankton with respect to the number of species are as increasing number Rotifera > Cladocera > Copepoda > Ostracoda.

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