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Study on Zooplankton of Fresh Water Pond of Sindewahi, Maharashtra, India.

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ABSTRACT
Zooplankton are the microorganism feeds on the phytoplankton. They are the food of carnivorous as well as omnivorous fishes, They have been reported in percentage composition of different groups. The diversity of various types of zooplankton was studied of fresh water pond of Sindewahi Maharashtra Located Latitude: 200 17′ 22. 18″ N and Longitude: 790 39′ 05. 70″ E. The planktonic forms were collected from the surface of the pond water with plankton net of 20µ mesh size nylon cloth. The plankton samples were preserved for laboratory analysis. The collected samples were identified using standard references. The result revealed that the zooplankton were represented by various phyla like, protozoa, helminthes, rotifera, annelida, arthropoda etc. Arthropods have been reported maximum in number of varieties and percentage amount in the total zooplankton followed by Rotifer in general. The range of zooplankton between 174 to 769 n/l, and average was 378.42 n/l, the minimum zooplankton was in March and maximum were in the month of October. The annual percentage composition of various representative groups of zooplankton revealed 7.90% protozoa, 35.32% Rotifer, 5.41% Arthropoda and Miscellaneous 2.64%. The detailed aspect of monthly variation, percentage composition and diversity of zooplankton is discussed herein.

Keywords: Zooplankton, Pond, Sindewahi .Rotifer, Protozoa.

INTRODUCTION

In the tropical country like India, highly seasonal rainfall and heavy discharge of water during monsoons results in high flushing rate in the most of the water bodies [1]. Therefore, the consistency and productiveness of biotic component is variable. Plankton by virtue of drifting habit and short turnover period constitutes major link in the trophic structure and events in the pond ecosystem. A rich plankton community is the hallmark of Indian ponds that can be attributed to abiotic factors and nutrient load variability [2,3]. It is found that nitrates and phosphates are lacking in pond this has relation with high numerical abundance of plankton in this reservoir [1,3]. pH has positive relation with abundance of zooplankton. Zooplankton was represented by three different group viz., protozoa, rotifera and arthropoda. Percentage compositions of these planktonic forms were indicative of its richness and possible contribution in organic productivity as well as trophic status maintenance [4,5,6]. It is usually observed that the greater population of the rotifers appeared in waters with eutrophication state of the reservoir. The presence of copepods is indicative of pray – predator relationship among zooplankton [7].

METHODOLOGY

Study Site:

Study site fresh water pond is located in Sindewahi Dist. Chandrapur Latitude: 200 17′ 22 .18″ N and Longitude: 790 39′ 70.05″ E. This perennial pond is rain fed as well as receives flood water from Sindewahi and Lonwahi villege. Primarily the water resource is identified to be utilized for irrigation. This long seasonal pond has the catchment area of 31.8 sq. km which is used for capture fisheries as well as stocking of Indian Major Carps.

The surface water samples were collected from different locations of the reservoir randomly from June 2018 to May 2019 and such samples were pooled together to consider final sample for analysis. All samples were collected at trice in month during morning hours. The samples were collected by filtering 10L of water through plankton net of 20µ pore size filtering cloth and concentrated up to 100 ml. The concentrated zooplankton sample was preserved immediately with the help of 4% formalin. The samples were analyzed qualitatively under the microscope for different types of zooplanktons. The identification of zooplanktons was carried out by using keys and published literature. The quantitative estimation was done by using Sidgwick rafter cell. Zooplankton was represented by three different group viz., protozoa, rotifera and arthropoda. Percentage compositions of these planktonic forms were indicative of its richness and possible contribution in organic productivity as well as trophic status maintenance. It is usually observed that the greater population of the rotifers.

RESULTS AND DISCUSSION

The range of zooplankton between 174 to 769 n/l, and average was 378.42 n/l, the minimum zooplankton was in March and maximum were in the month of October, (table-1). The zooplankton forms were represented in the phylum like Protozoa, Rotifera and Arthropoda, wherein Arthropoda was dominating two different sub classes of Arthropoda, i.e. Copepods (73.43%) and Cladocera (26.56%) were abundantly present in the water of this pond (table-2). Correlation of physico-chemical properties with zooplankton abundance indicates positive relationship. All the types of zooplanktonic forms indicates marginal declined trend from June to May with no significant relationship with monthly variations.

However, during month of September, October and November comparatively plankton density was high that coincides with the similar condition for nutrients as well as some physico-chemical property of water. The annual percentage composition of various representative groups of zooplankton revealed 7.90% protozoa, 35.32% Rotifer, 5.41% Arthropoda and Miscellaneous 2.64%. Annual average percentage of zooplankton from pond revealed different forms in their density attributed to water quality. Protozoan and Rotifers were less numerically however, Arthropods were comparatively more. Arthropods were represented by variety of copepods and cladocerans. Larvae and nymphs of several insects

were observed specific seasonal variation. During post monsoon such stages were abundant. The density and diversity of zooplankton certainly get influenced by the physico-chemical properties of water.

Table 1 : Monthly variation in zooplankton density (no/liter)

Month	Protozoa	Rotifer	Arthropoda	Miscellaneous	Total
Jun	15	71	160	11	257
Jul	32	125	239	12	408
Aug	34	161	246	7	448
Sep	44	239	341	16	640
Oct	82	241	437	9	769
Nov	34	171	258	8	471
Dec	12	79	96	6	193
Jan	17	88	143	3	251
Feb	18	131	127	21	298
Mar	12	52	103	8	175
Apr	22	81	111	10	224
May	35	165	197	10	407
Total	359	1604	2458	120	4541
%	7.90 %	35.32%	54.12 %	2.64%	-----

Table 2 : Type compositions of Arthropods

Months	Copepods	Cladocera
Jun	121	40
Jul	168	71
Aug	189	57
Sep	234	106
Oct	304	133
Nov	186	72
Dec	76	24
Jan	111	33
Feb	102	25
Mar	85	14
Apr	69	42
May	164	37
Total	1809	654
%	39.74%	14.38 %

CONCLUSION

The above Sindewahi pond is rain fed as well as receives flood water from Sindewahi and Lonwahi. Primarily the water resource is identified to be utilized for irrigation. The zooplankton study was carried out to understand its relation with water quality parameters. The range of zooplankton between 174 to 769 n/l, and average was 378.42 n/l, the minimum zooplankton was in March and maximum were in the month of October. The zooplankton forms were represented in the phylum like Protozoa, Rotifera and Arthropoda.

The Arthopods were dominated as two different sub classes i.e. Copepods (73.43%) and Cladocera (26.56%). During month of September, October and November comparatively plankton density was high that

coincides with the similar condition for nutrients as well as some physico-chemical property of water. The annual percentage composition of various representative groups of zooplankton revealed 7.90% protozoa, 35.32% Rotifer, 5.41% Arthropoda and Miscellaneous 2.64%. Zooplankton is one of the necessities to evaluate fresh water reservoir in respect to their ecological and fisheries status.

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

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