



**THE SEASONAL DISTRIBUTION AND QUANTITATIVE STUDY OF TANK
PLANKTONS OF DRAUGHT PRONE REGION OF TASGAON TAHSIL OF SANGLI
DISTRICT MAHARASHTRA (INDIA)**

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Abstract

In the seasonal distribution study of phytoplanktons conducted in Siddhewadi tank, the Chlorophyceae (64.68%) was dominating in monsoon. In winter season (64.46%) and also during summer season (57.7%) the Bacillariophyceae was the dominating group of phytoplanktons. In the seasonal distribution study of Zooplanktons conducted in Siddhewadi tank, the Rotifera (64.43%) is dominant group during monsoon. During winter season the Cladocera (56.8%) and Ostracoda (56.86%) were the dominant groups of Zooplanktons. During summer Rotifera (58.7%) and Copepoda (58.5%) were the dominating zooplanktons.

Keywords : Seasonal distribution – Quantitative study – Tank Planktons.

Introduction :

Other than physico-chemical parameters, the biogenic capacity of the water body or pond is important. The biogenic capacity means its capacity to produce the natural food to feed and sustain fish. The flora, fauna and planktonic population useful for fish feeding, which develop in the water, as well as the rate of current of water, among others are indices of its biogenic capacity (Srivastava, 1988).

The limnologists generally consider planktons to be tiny forms of life. However, this group encompasses organisms whose size spans three orders of magnitude. Plankton includes forms of aquatic bacteria and ultra-algae only a few microns in diameter and macroscopic forms of crustacean several millimeters long. Thus, the plankton encompasses a wider range of sizes than do the larger macroscopic nekton.

In a water body, there usually occur seasonal qualitative and quantitative fluctuations in the planktonic population in temperate as well as tropical climates. Certain planktonic populations apparently disappear at specified periods and reappear during others. Such temporary disappearances are due to the fact that the species concerned either become to scarce or occur as spores, resting eggs etc. which are not easily detectable. Upon the return of favourable conditions, spore germinate and the plankters multiply.

Considering above facts the Siddhewadi water tank, from draught prone region was investigated for the seasonal distribution of planktons.

Materials and Methods :

The water samples were collected in small plastic bottles of about 100 ml. size, during the morning and evening hours. Plankton net of bolting silk of mesh size 125 micron was used for collection of planktons.

The collected samples were fixed in 4% formalin on the spot. Then water samples were studied under microscope in the laboratory for qualitative and quantitative analysis by Sedgewick rafter cell.

The planktons were identified by using standard literature of Fritsch (1965); Adoni et. al. (1985) ; Biswas (1980); Tonapi (1980); Sarode and Kamat (1984); Cox. (1996); Ward and Whipple (1959) and Sreenivas and Duthie (1973); Pennak (1978); Sehgal (1983) and other standard available published literature.

Results and Discussion

Plankters, according to their quality, may be classified as Phytoplankton and Zooplankton. Phytoplankton consists of chlorophyll bearing organisms, eg. Microcystis, Volvox etc. and the non-photosynthetic plants or Saproplankton e.g. Bacteria and Fungi. Zooplankton consists of plankters of animal origin.

Phytoplanktons forms the base of the food for many animals and therefore is extremely important to the ecosystem. Phytoplanktons are the product and belong to first tropic level (autotrophs); (Dholakia 2004). According to Nasare et. al. (2009), phytoplanktons are the pioneer of an aquatic food chain.

Zooplankton diversity is one of the most important ecological parameters in water quality

assessment (Lokhande and Shembekar, 2012). The Zooplankton community composition and structure is affected by eutrophication (Blancher, 1984)

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In the seasonal distribution study of zooplanktons conducted in Siddhewadi tank, the Rotifera (64.43%) is dominant group during monsoon. During winter season the Cladocera (56.8%) and Ostracoda (56.86%) were the dominant groups of zooplanktons. During summer Rotifera (58.7%) and Copepoda (58.5%) were the dominating zooplanktons.

The seasonal fluctuations of various groups of phytoplanktons and zooplanktons was studied by Saha et. al. (1971) and reported that the phytoplankton concentration during the two years of observations varied considerably. Similar results were obtained during the study of phytoplanktons of Siddhewadi tank.

According to Jhingran (1983), among zooplankton, Rotifers dominated and were followed by Copepod. Protozoans and Cladocerans formed an insignificant number in the total plankton. Protozoans were negligible in both the years. In present investigation of

Siddhewadi tank also the negligible amount of protozoans were reported and the number of phytoplanktons and zooplanktons was insignificant during both the years of study.

Das and Srivastava (1956 and 1959) reported bimodal pattern of plankton production in fresh water ponds of Uttar Pradesh. The Planktonic peaks in these ponds were recorded during monsoon. These results are also correlated with the results obtained in present investigation.

The quantitative study of phytoplanktons in Siddhewadi tank shows 20 species of Cyanophyceae, 31 species of Chlorophyceae, 1 Species of Euglenophyceae, 2 species of Dinophyceae and 21 species of Bacillariophyceae. Specieswise Chlorophyceae is dominating followed by Bacillariophyceae, Cyanophyceae, Dianophyceae and Euglenophyceae. Population wise Chlorophyceae, Bacillariophyceae and Cyanophyceae were dominating to other groups.

In the quantitative study of zooplanktons of Siddhewadi tank 09 species of Rotifera, 3 species of Copepoda, 11 species of Cladocera, 1 species of Ostracoda and 08 species of Protozoa were reported. Groupwise Cladocera is dominating group followed by Rotifera, Protozoa, Copepoda and Ostracoda. Populationwise Rotifera was the dominating and followed by Cladocera, Protozoa, Copepoda and Ostracoda.

Table 1 : Seasonal distribution in Phytoplankton (No./ltr) and Zooplankton (No./ltr) in Siddhewadi tank during 2012-2014 (Percentage Composition in Parenthesis).

Sr. No.	Planktons	Season		Winter		Summer	
		Year	2012-13	2013-14	2012-13	2013-14	2012-13
A.	Phytoplanktons						
1)	Cyanophyceae	290 48.3%	310 51.6%	680 48.2%	730 51.7%	1413 53.6%	1222 46.3%
2)	Chlorophyceae	1508 64.68%	824 35.3%	2781 55.46%	2833 56.5%	3513 53.7%	3024 46.2%
3)	Euglenophyceae	34 40.4%	50 59.5%	22 15.06%	124 84.9%	108 44.6%	134 55.37%
4)	Dinophyceae	00 0.0%	00 0.0%	08 8.0%	00 0.0%	09 9.0%	00 0.0%
5)	Bacillariophyceae	2213 63.17%	1290 36.82%	3300 64.46%	1819 35.53%	3302 57.7%	2418 42.27%
B.	Zooplankton						
1)	Rotifera	368 64.43%	231 38.56%	123 55.6%	98 44.34%	223 41.2%	318 58.7%
2)	Copepoda	53 58.24%	38 41.7%	110 53.3%	96 46.6%	97 41.45%	137 58.5%
3)	Cladocera	84 46.9%	95 53.07%	120 56.8%	91 43.12%	78 45.6%	93 54.38%
4)	Ostracoda	14 14.0%	00 0.0%	22 43.13%	29 56.86%	73 54.8%	60 45.11%
5)	Protozoa	00 0.0%	00 0.0%	02 2.0%	00 0.0%	00 0.0%	06 6.0%

Note : All the values are mean of four sites i.e. S I, S II, S III and S IV

Conclusion :

- 1) There are marked seasonal variations in the occurrence and abundance of various plankters and groups of plankters.
- 2) Each plankter is directly or indirectly subject to a complex of influences in the Physico-chemical regime of the water brought about by changes of seasons.
- 3) The appearance of phytoplanktons depends on the availability of nutrients, degree of stratification and incidence of grazing.
- 4) Algal forms like Spirogyra, Aphanothece, Aphanocapsa, Oscillatoria and Lyngbya may be seen in large or small quantities throughout the year as constant forms in tank. Other forms are seen for short periods but are not really constant.
- 5) Even though algae are highly adaptable to environmental conditions, hydrological and climatological changes do affect them to a great extent.
- 6) Correlated with seasonal changes, fluctuations in the density and the composition of planktonic growths occur.

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