

The Study of Physico-Chemical Parameters And Plankton Diversity of the ponds in The V.P.M. Campus, Thane, Maharashtra, India.

Kamini Mahale and Madhura Malvankar

Dept. of Zoology, B. N. Bandodkar College of Science, Thane

Introduction

The study of phytoplanktons was done in ponds present in V.P.M. campus, Thane. Various ponds have been made in the college campus for aesthetic value. The ponds showed growth of various aquatic plants such as *Pistia*, *Hydrilla* and small fishes. The study was done to find out the presence growth of phytoplankton and zooplanktons in these ponds.

Phytoplankton are small microscopic, photosynthetic organisms. They are among the primary producers in the aquatic ecosystems. They are vital parts of food chain in the aquatic ecosystems. The abnormal increase in their number indicates pollution.

Materials And Methods

Collection of water was done using plastic bottle. There were 7 ponds labeled as 1 to 7.

The physico-chemical parameters such as Dissolved oxygen, Temperature, pH, Chlorides, Nitrates and Nitrites were studied. The book referred for estimations was Chemical

And Biological methods For Water Pollution Studies by R.K.Trivedi and P.K.Goel.

The collection of sample for phytoplankton

The samples were collected from the surface using one liter glass jar. The samples were immediately fixed using 4% Formaldehyde in Lugol's Iodine solution. The sample was left undisturbed for 24 hours to allow the settling of phytoplankton and then the settled part of solution was transferred in other capped plastic container.

The subsamples were observed under high power of microscope. The checklist of the phytoplankton species was prepared

The identification key given by Caljon (1983) was used.

Result and Discussions

Physico-chemical properties of water:

The water parameters are shown in table no 1.

Table 1: Physico-chemical parameters of water of 7 ponds

WATER PARAMETERS	Temperature °C	pH	Dissolved oxygen (mg/l)	Nitrates (mg/l)	Nitrites (mg/l)	Chlorides (mg/l)
POND 1	27°C	7.5	3.6	0.266	0.011	17.04
POND 2	27°C	7.25	3.8	0.077	0	18.46
POND 3	28°C	7.25	3.2	0.033	0.022	8.52
POND 4	29°C	7	3.4	0	0.135	49.7
POND 5	27°C	7.5	3.4	0.022	0.011	8.52
POND 6	27°C	7.5	4.6	0	0.566	19.88
POND 7	29°C	7.5	4.2	0.022	0	24.14

pH: The pH of the sample was found to be near neutral. The pH was not highly acidic or alkaline. It can be said to be suitable for the life.

Nitrites: Nitrites were in the range of 0-0.566mg/l. pond 6 had the highest concentration of nitrites, while pond 2 and 7 showed absence of nitrites.

Nitrates: Nitrates were in the range of 0-0.266mg/l. Pond 4 and Pond 6 showed absence of nitrates while pond 1 showed the highest concentration of nitrates.

Chlorides: Chlorides were in the range of 8-25 mg/l. Pond 4 had highest concentration of Chlorides (49.7mg/l) while lowest concentration was recorded in pond 6 and Pond 3 (8.52 mg/l)

Dissolved Oxygen: Dissolved oxygen of all the ponds was found to be above 3mg/l which is above the limit given by WHO.

The plankton diversity

The plankton diversity was found to be very poor. Among the phytoplankton species, *Chlorella* spp, *Navicula* spp, Diatoms were found. Pond 4, 6 and 7 showed high density of phytoplankton. Pond 1 and 3 showed least density of phytoplankton. Ponds 2, 4, 5, 6 showed the presence of zooplankton as well. Pond 2 and 4 showed presence of Rotifers. Pond 6 showed presence of zooplankton from class Cladocera. Zooplankton from Cyclopoda, and the larvae of zooplankton were also found.

Conclusion

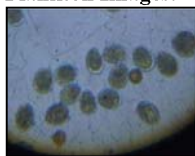
Very poor phytoplankton diversity was observed in these ponds and may be caused by several factors. Light penetration was low. Numerous plants were growing on the surface of the water like lotus, hydrilla, Water hyacinth, *Pistia*, etc. Water was highly turbid. Dissolved oxygen levels were low at the area below the plant community covering. Poor quality of water contributed to low phytoplankton diversity. Ponds with more depth showed higher density of phytoplankton and zooplanktons were observed compared to the ones with less depth. The ponds showing more covering of plants showed less number of both phytoplankton and zooplanktons.

Table2: Plankton diversity in all the ponds

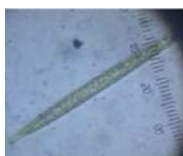
POND	Phytoplankton	Zooplankton
1	<i>Chlorella</i> spp.	-
2	<i>Chlorella</i> spp.	Rotifer
3	<i>Chlorella</i> spp.	-
4	<i>Navicula</i> spp., <i>chlorella</i> spp.	Rotifer
5	<i>Chlorella</i> spp.	-
6	<i>Navicula</i> spp., <i>Chlorella</i> spp.	Cyclopoda
7	<i>Chlorella</i> spp., diatom	Cladoceran



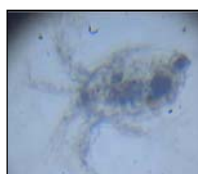
Plankton Images:



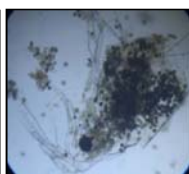
Chlorella spp.



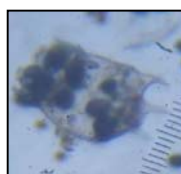
Diatom



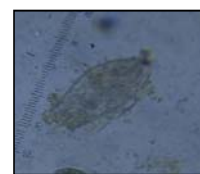
Zooplankton larva



Zooplankton
(Cladoceran)



Rotifer



Rotifer

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