Study the Phytoplankton Species in Chikliya pond District Barwani M.P. India

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Abstract

Biodiversity Species is an abbreviation of two words "Biological" and "Diversity". It refers to the life style of all types of organisms that are found on this earth, such as trees, plants, animals, fungi, algae and micro-organisms, as well as the habitat for these communities in which they live. Biodiversity is not just a part of yoga but the conservation of all types of ecosystems, species and genetic material. Rather, it represents that there is variability within and between them. Phytoplankton and zooplankton constitute an important link in an ecosystem's food chain and fish yields are largely interrelated based on their abundance. The abundance of phytoplankton and zooplankton is governed by the interplay of a number of physical, chemical and biological processes. current investigation.Was carried out to study the Barwani MP. In the present study the phytoplankton population was found to be comprising of four major group viz. Chlorophyceae, Bacillariophyceae, Cyanophyceae and Euglenophyceae. In the present investigation 31 species of phytoplankton have been recorded of which 16 belonged to Chlorophyceae, 6 to Bacillariophyceae, 8 to Cyanophyceae and 1 to Euglenophyceae respectively.

Keywords: *Phytoplankton, Species, Chikliya pond.*

INTRODUCTION

The geographical location of the Barwani is 22002’ north latitude and 74055’ East longitude and 165.50 m. above MSL. It is bounded by mountain ranges from three sides, namely ‘Satpura’ in the South; ‘Vindhyanchal’ in north and Maikal ranges (Part of Vindhyanchal) in the east. River Narmada the ‘lifeline of M. P.’ makes its north boundary from where district Dhar starts. It touches the boundaries of adjacent district, Khargone in East and North east while Maharashtra is located at Southern and Southern West.Plankton are slow swimmers, but most swim are small organisms called the water column of the ocean and the dens of fresh water. The name comes from the Greek group plankton meaning "wanderer" and "drifter". Plankton is made up of small plants called phytoplankton and organisms called zooplankton, as well as organisms that are not easily classified into two groups I (such as protozoa and bacteria). Plancktonic organisms are found hanging in water and are so small that even a slight current keeps them moving. The fish feed on phytoplankton, zooplankton, and animals attached to small plants and objects at the bottom of the pond. These have also been used as bioindicators of water quality. Many studies are being done on freshwater quality in India.

Aim of the study The present investigation is done to explore biodiversity and climate change. of Phytoplankton in "Chikliya Talab" of Barwani district. The phytoplankton population in the present study was found to consist of four major groups. Chlorophyceae, Bacillariophyceae, Cyanophyceae and Euglenophyceae. 31 species of phytoplankton have been recorded in the present investigation, out of which 16 are of Chlorophyceae, 6 of Bacillariophyceae, 8 of Cyanophyceae and 1 of Euglenophyceae.

Material and Methods

Biological Estimations Collection, Preservation and Identification of Plankton

The plankton samples were collected following Welch (1953) and Lind (1979) by filtering 40 liters of water through small plankton net made up of bolting silk no. 25 (64u mesh size). The concentrate was preserved in 5% formalin and Lugol's solution for phytoplankton and zooplankton study respectively. The phytoplankton was identified with the help of key's given by Smith (1950), Edmondon (1959), Prescott (1951 and 62) and Adoni (1985). Counting of the individual phytoplankton was done by drop count method (Adoni, 1985) using the formula.

Phytoplankton / Lit. = A x 1/L x n/V

Where;

A = Average no. of organism /drop

L = Volume of original sample in ml

n = Volume of one drop in ml.

V = Total volume of the concentrated sample in ml.

The zooplankton was identified with the help of keys provided by Edmondson, 1959; Needhan and Needhan, 1962; Vasisht and Battish, 1971; Tonapi, 1980; Sehgal, 1983; APHA, 1985; and Adoni, 1985.Counting of the individual zooplankton was done by Sedgwick Rafter Cell (Adoni, 1985) method using formula.

Zooplankton /Lit. = n (V/v) 1/c x 103

Where;

n= total no. of individuals in observed transacts

V = Volume of the sample in counting cell in mm3

v= Volume of Observed transects in mm3

$$\text{C = Concentration factor} = \frac{\text{Original Volume of sample (ml)}}{\text{Volumes of sample concentrate (ml)}}$$

Biomass-Biomass values were calculated by filtering a known volume of water. The wet weight, dry weight and ash weight of the collected plankton is expressed in mg/lit.

Productivity-Primary productivity was measured by dark and light bottle technique of Gaarder and Gran (1927).Along with productivity NP/R, NP/GP ratio and percentage of respiration was also calculated. The followings expression was used for calculating gross and net productivity and community respiration.

Gross Oxygen Production = LB – DB

Net Oxygen Production = LB – IB

Community Respiration = IB – DB

Where:

LB = Light Bottle

DB = Dark Bottle

IB = Initial Bottle

Table:- Monthly variation in phytoplankton density in Chikliya pond (NO./L) 2021

S.N.	Name of group and species	Jan.	Feb.	Mar.	Apr.	May.	June.
	Chlorophyceas						
1	Ankistrodesmus sp.	9	20	0	0	0	0
2	Coelastrum sp.	11	9	19	9	14	10
3	Cosmarium sp.	0	5	17	14	6	0
4	Chara sp.	39	29	0	0	0	0
5	Chlorella sp.	21	0	0	0	24	22
6	Chlosterium sp.	9	6	0	0	0	0
7	Gonium sp.	19	11	9	0	0	0
8	Mougeotia sp.	0	0	0	3	0	0
9	Oedogonium sp.	0	0	0	19	22	0
10	Pandorina sp.	0	10	0	4	0	10
11	Pendiastrum sp.	68	29	13	0	15	13
12	Scenedesmus sp.	0	0	23	37	12	0
13	Spirogyra sp.	5	6	0	0	3	5
14	Ulothrix sp.	0	0	0	0	12	12
15	Volvox sp.	19	26	26	0	0	0
16	Zygnema sp.	8	3	0	0	0	0
	Total species	**206**	**154**	**116**	**86**	**113**	**72**
	Bacillariophyceae						
1	Amphora sp.	34	42	7	0	0	0
2	Diatoma sp.	23	35	19	9	7	16
3	Frustulia sp.	0	0	14	15	26	0
4	Pinnularia sp.	0	8	21	36	29	10
5	Tabellaria sp.	0	0	0	16	10	0
6	Novicula sp.	0	0	9	13	9	0
	Total species	**57**	**85**	**70**	**89**	**81**	**26**
	Cynophyceae						
1	Anabaenopsis sp.	37	31	30	0	0	0
2	Aphanizomenon sp.	12	16	19	27	29	11
3	Lyngbya sp.	15	9	24	0	26	0
4	Merismopedia sp.	0	0	0	31	17	87
5	Microcystic sp.	7	21	141	74	198	94
6	Nostoc sp.	0	0	0	9	26	9
7	Spirulina sp.	6	13	39	24	62	28
8	Oscillactoria sp.	221	281	121	0	139	0
	Total species	**298**	**371**	**374**	**160**	**497**	**229**
	Euglenaphyceae						
1	Euglena sp.	0	6	0	56	0	11
	Total species	**0**	**6**	**0**	**56**	**0**	**11**

Group:- Chlorophyceae

Fig.1 Ankistrodesmus Sp.

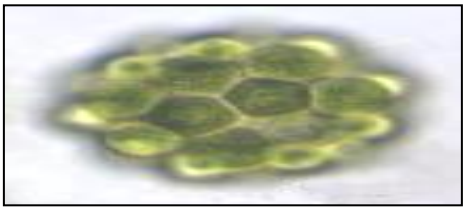


Fig. 2 Coelastrum Sp.

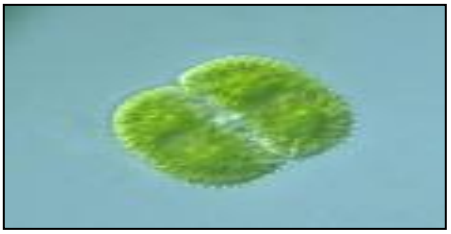


Fig. 3 Cosmarium Sp.

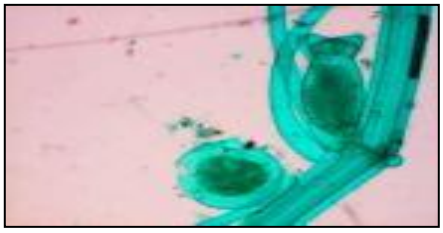


Fig. 4 Chara Sp.

Fig. 5 Chlorella Sp.

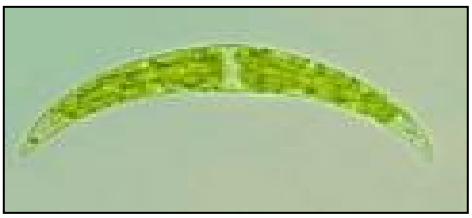


Fig. 6 Closterium Sp.

Fig. 7 Gonium Sp.

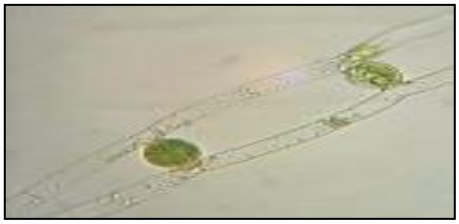


Fig. 8 Mougetia Sp

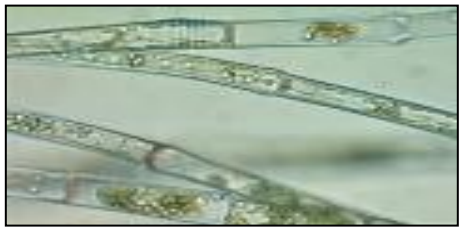


Fig. 9 Oedogonium Sp.

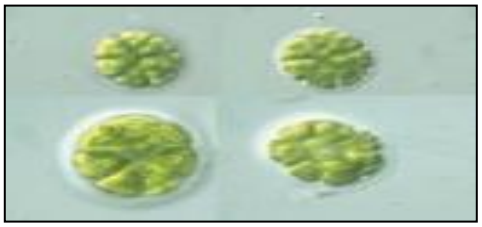


Fig. 10 Pandorina Sp.

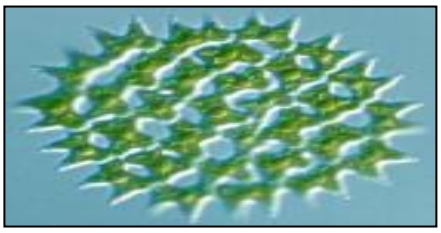


Fig. 11 Pendiastrum Sp.

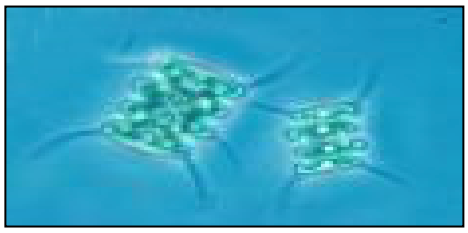


Fig. 12 Scendesmus Sp.

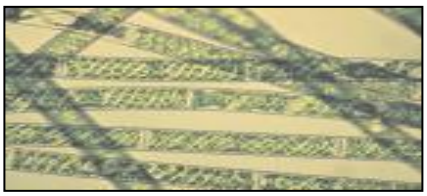


Fig. 13 Spirogyra Sp.

Fig. 14 Ulothrix Sp.

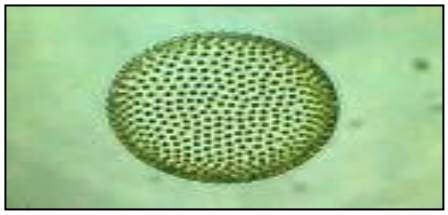
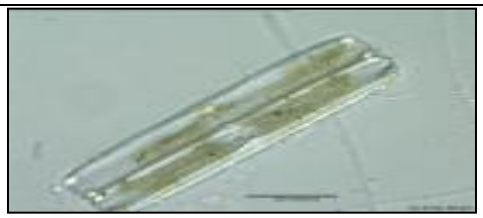
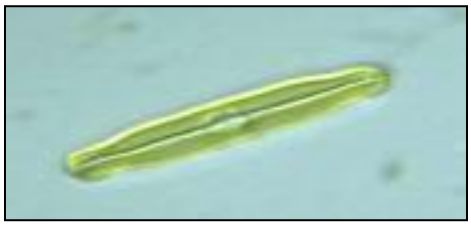


Fig.15 Volvox Sp.

Fig. 16 Zygnema Sp.

Group: - Bacillariophyceae	
	
Fig. 17 Amphora Sp,	**Fig. 18 Diatoma Sp.**
	
Fig. 19 Frustulya Sp.	**Fig. 20 Pinnularia Sp.**

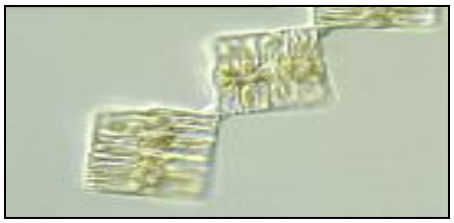
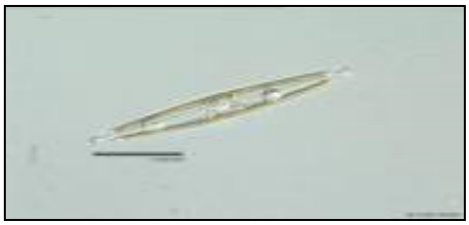

	

Fig. 21 Tabellaria Sp.	**Fig. 22 Novicula Sp.**
Group:- Cyanophyceae	
	
Fig. 23 Anabaenopsis Sp.	**Fig. 24 Aphanizomenon Sp.**

Fig. 25 Lyngbya Sp.

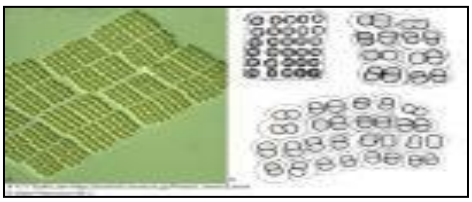


Fig. 26 Merismopedia Sp.

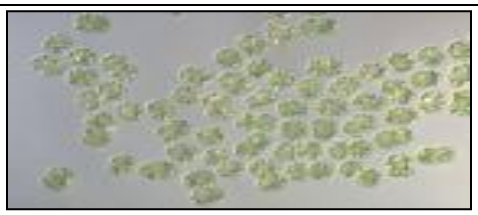


Fig. 27 Microcystis Sp.

Fig. 28 Nostoc Sp.

Fig. 29 Spirulina Sp.

Fig. 30 Oscillatoria Sp.

Group: -Euglenophyceae

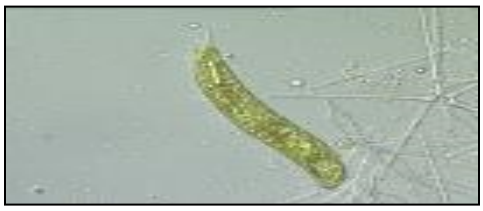


Fig. 31 Euglena Sp.

Result and Discussion

Population Dynamics of Phytoplankton -In the present study the phytoplankton population was found to be comprising of four major group viz. Chlorophyceae, Bacillariophyceae, Cyanophyceae and Euglenophyceae. In the present investigation 31 species of phytoplankton have been recorded of which 16 belonged to Chlorophyceae, 6 to

Bacillariophyceae, 8 to Cyanophyceae and 1 to Euglenophyceae respectively.

Chlorophyceae:-In the this group contributed phytoplankton during six month. The density of Chlorophyceae 72 NO/Lit. To 206 NO /Lit. The density of minimum density was observed in the month of June and the maximum in January.

Bacillariophyceae:-Bacillariophyceae contributed phytoplankton during six month. The density of this group ranged between 26 NO /Lit.To 89 NO/Lit. The minimum density was observed in the month of June and the maximum in April.

Cyanophyceae:-In the group Cyanophyceae contributed phytoplankton during six month. The density of this group ranged between 160 NO/Lit. To, 497 NO/Lit. The minimum density was observed in April and maximum in May.

Euglenophyceae:-In the group Euglenophyceae contributed phytoplankton during six month. The density of this group ranged between 6 NO/Lit. To, 56 NO /Lit. The minimum density was observed in February. And maximum in April.

Conclusion

Water is an important component of many types of organisms, plants and human life on earth. And studying the physico-chemical function of water shows that water is efficient to drink, and aquatic animals are capable of rearing. The purity of water is tested through various parameters, and the quality of the water is determined.

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