

## ORIGINAL ARTICLE

# Population kinetics and seasonal fluctuation of Phytoplankton of Vishnupuri dam, Nanded district, (M.S) India.

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## ABSTRACT

Population Kinetics and seasonal fluctuation of Phytoplankton of Vishnupuri dam of Nanded district was under takes during the year June 2015 to May 2016. Phytoplankton population kinetics was composed of nineteen species of Chlorophyceae, five species of Euglenophyceae, Eight species of Bacillariophyceae, Nine species of cyanophyceae. Among phytoplankton particularly Chlorophyceae was the dominant group throughout the study. The highest count of 1106 species was recorded in the month of May.

**Keywords:** Vishnupuri dam, Zooplankton, Rotifera, Cladocera, Ostracoda.

## INTRODUCTION

The Godavari river is the most important river in Marathwada region. It has the Source at Trimbakeshwar in Sahydries hills near Nasik, this river enters in Aurangabad district and flowing through Beed, Parbhani and Nanded distict. The other river of maratwada region are Purna Penganga, Dudna, Asna, Sindhphana Bindusara, which are used for drinking water, agriculture industries and fisheries purpose. The phytoplankton being the primary producer from the lowest tropic level in the food chain of fresh water ecosystem and plays a key role in fish culture. The plankton occur in all natural waters as well as, in artificial impoundments like ponds, tanks, reservoirs, irrigation canals, etc. Different group of phytoplanktons exist in different types of water bodies planktonic study is a very useful tool for the assessment of water quality in any type of water body and also contributes to an understanding of the basic mature and general economy of the lake. Phytoplanktons are general economy of the lake. Phytoplanktons are those organisms which float aimlessly or swim feebly to maintain constant position against water current. They produce aromatic or fishy odours in water and also cause clogging of filter units and screen nets. However, no particular

group can be assigned to pollution. The planktons are good indicator of changes in water quality because it is strongly affected by environmental conditions and responds, quickly to changes in environmental quality. The occurrence and abundance of planktons depends on its productivity, which in turn is influenced by a biotic factor and the level of nutrients. Thus, planktons play an important role in the trophodynamics, cycling and aquaculture productivity in the aquatic ecosystem. The number and species of phytoplankton serves to determine the quality of water body. The structure of aquatic community is important in monitoring the water quality. Many workers have published their work on aquatic environment and ecology of phytoplankton in fresh water [1,2,3,4,5,6,7,8,9,10,11,12].

The present investigation has been undertaken to study the seasonal changes in phytoplankton population kinetics of Vishnupuri dam. Qualitative and quantitative analysis of phytoplanktons population kinetics were carried out. Vishnupuri dam is a cross on the Godavari River in Nanded District, Maharashtra.

## METHODOLOGY

### Study site:

Nanded city receives its daily water supply from Vishnupuri dam situated near Asarjan village on the river. The command area of the dam is distributed in Nanded, Kandhar & Loha taluka of Nanded district. The dam has a live storage of about 80.79 million cubic meters, out of which 43.95 million cubic meters storage is reserved for drinking purpose for Nanded city and 10.26 million cubic meters storage is reserved for industrial applications.



**Fig. 1: Vishnupuri Dam constructed on Godavari River in Nanded**

### Methods:

The water samples for phytoplankton analysis were collected from the dam for a period of 12 months starting from June 2015 to May 2016 from four stations (A, B, C & D). The sample was collected with the help of plankton net. The sample was taken in 500 ml. bottle and preserved in 4% formalin. The samples were collected monthly in the morning between 7:00 A.M. to 9:00 A.M. The quantitative and qualitative analysis was carried out by taking 20 ml of concentrate obtained by siphoning the supernatant liquid. Identification of phytoplankton in different class of different genera were carried out under research microscope. Phytoplankton were counted by drop count method and the results were converted to organisms per ml of water. The identification was done up to generic level as described by Fritsch [13], Desikachary [14] and APHA [15].

## RESULT AND DISCUSSION

The total number of phytoplankton and monthly average phytoplankton number per ml are given Table. The prominent group of phytoplankton identified during present study were chlorophyceae, cyanophyceae, Bacillariophyceae and Euglenophyceae. The list of phytoplanktons observed is given below: -

**1) Chlorophyceae:** *Micrasterias species, oedogonium patulum, pediastrum duplex, pediastrum duplex, pediastrum simplex, scenedesmus armatus, scenedesmus carinatus, spirogyra, Ankistrodesmus falcatus, chlamydomonas conferta, chlorella conglanerata, chlorella ulgoris, cladophora, closteridium limneticum, cosmarium contractum, Helimeda species, Hydrodictyon, Ulothrix Zonta, Zygnema species.*

### 2) Cyanophyceae:-

*Merismopedia punctata, microcystis aeruginosa, Notoc, Phormidium mucoid, Oscillatoria chlorine, Oscillatoria limosa, Anabaena constricta, Anacystis species, Aphanotheca nidulanus.*

### 3) Bacillariophyceae: -

*Fragillaria capurina, Navicula gracills, N. radiosa, N. Viridula, Nitzschia subtilis, Synedra affinis, Bacillaria paradoxa, Diatom sp. Diatom vuloare, Synedra ulna.*

### 4) Euglenophyceae: -

*Euglena stellata, Euglena viridis, Euglena pisciformis, Euglena acus, Euglena anabaena var. minima.* The monthly variations in the density of different group of phytoplankton is shown in the table.

Table 1: Monthly fluctuation of Phytoplankton (count/ml.) of Vishnupuri Dam during the year 2015-2016

Phytoplankton Group	Station	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Chlorophyceae	A	99	70	45	35	80	123	130	182	210	218	240	287	1719
	B	110	72	40	38	92	131	187	174	218	233	231	271	1797
	C	106	85	49	41	78	125	138	190	208	211	223	267	1721
	D	109	90	53	48	81	128	142	186	205	228	242	281	1793
<b>Total</b>		<b>425</b>	<b>317</b>	<b>187</b>	<b>162</b>	<b>331</b>	<b>507</b>	<b>597</b>	<b>732</b>	<b>841</b>	<b>890</b>	<b>936</b>	<b>1106</b>	<b>7030</b>
Euglenophyceae	A	38	24	15	21	28	19	09	12	87	67	91	102	513
	B	40	32	24	36	39	33	13	17	72	71	87	105	569
	C	43	37	28	31	35	38	22	29	78	83	92	108	624
	D	39	35	29	37	41	43	31	36	82	87	98	113	671
<b>Total</b>		<b>160</b>	<b>128</b>	<b>96</b>	<b>125</b>	<b>143</b>	<b>133</b>	<b>75</b>	<b>94</b>	<b>319</b>	<b>308</b>	<b>368</b>	<b>428</b>	<b>2377</b>
Bacillariophyceae	A	82	68	35	71	57	115	167	231	228	170	165	217	1566
	B	70	62	37	34	55	110	170	222	231	173	168	219	1551
	C	73	67	39	37	58	113	172	228	235	178	171	231	1602
	D	78	69	42	43	62	118	176	231	237	181	173	228	1638
<b>Total</b>		<b>303</b>	<b>266</b>	<b>153</b>	<b>145</b>	<b>232</b>	<b>456</b>	<b>685</b>	<b>912</b>	<b>931</b>	<b>702</b>	<b>677</b>	<b>895</b>	<b>6357</b>
Cyanophyceae	A	58	32	24	21	70	35	17	11	24	75	121	68	556
	B	57	35	26	23	68	32	14	13	27	72	115	63	545
	C	52	38	28	25	73	37	19	17	29	78	119	66	581
	D	51	33	30	28	65	39	23	19	31	80	123	69	591
<b>Total</b>		<b>218</b>	<b>138</b>	<b>108</b>	<b>97</b>	<b>276</b>	<b>143</b>	<b>73</b>	<b>60</b>	<b>111</b>	<b>305</b>	<b>478</b>	<b>266</b>	<b>2273</b>
<b>Grand Total</b>		<b>1105</b>	<b>849</b>	<b>544</b>	<b>529</b>	<b>982</b>	<b>1239</b>	<b>4030</b>	<b>1798</b>	<b>2202</b>	<b>2205</b>	<b>2459</b>	<b>2695</b>	<b>18037</b>

The present observation is similar to those observation made by other workers. Sirsat *et al.* [7], Bhagat and Meshram [9], Patil *et al.* [11], Sankarsan and Danies [12], Sheeba and Ramanujan [16] and Ugale *et al.* [17]. During the investigation following phytoplankton species were observed.

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