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Studies on monthly variations in phytoplankton diversity of Padalse (Lower Tapi) Dam from Amalner taluka of Jalgaon District

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Abstract

The present work is based on such important aspects of phytoplankton's diversity and availability in monthly variation pattern of different groups of algae in a year 2016-2017 of Padalse dam water bodies of Amalner taluka in Jalgaon District. Four different sites of dam were selected for sample collections in each month intervals from Nov-2016 to Oct-2017. Each month 30ml final sedimentation sample from 1000 ml collected water was analyzed into libratory with suitable technique and number of algal and phytoplankton count has been recorded. In water body of Padalse dam it was found that a different member of algal group found majorly Chlorophyceae, Cyanophyceae, Bacillariophyceae and Euglenophyceae. Chlorophyceae are dominant in entire year in each sites and become more abundance in month of July, August, September and October. The results were represented well in the forms of table and graphs with average of phytoplankton's availability in different months and groups.

Keywords: *Algae,Phytoplankton, Chlorophyceae, Cyanophyceae, Bacillariophyceae, Euglenophyceae Aquatic Ecosystems and Padalse Dam.*

INTRODUCTION

Phytoplanktons are act as very important role in aquatic ecosystems. They are indicator of water quality (APHA, 2005 and C.P., P.V.R. Nair and A.K. Kesavan Nair. 1974). Various biological phenomenon's in nature by phytoplankton effects on the life cycles of other aquatic life. Several species of phytoplankton play important role in early detection and monitoring the pollution and hence it act as integral component of water

ecosystem and determines the primary productivity (Gopinathan, C.P. 1972. And Gowda *et al.,* 2001).

The patterns of their availability, density and distribution in any water bodies is depend upon biotic and a-biotic factors (Singh, S. and Thakur, P. 2001, Gupta *et al.,* 2005 and Kauppila *et al.,* 2004). Because Phytoplanktons are formed prime component in the tropic cycle of marine and estuarine ecosystems they are influenced by the environmental factors. In recent years and changing scenario of rapid urbanization, industrialization and fluctuation or irregularities in the monsoons have affected the physico-chemical and biological characteristics of the water bodies and made remarkable influence in diversity of flora and fauna (Kulshrestha, S.K. and Johri, M. 1991, Selvaraj 2000 and Komala 2013).

METHODOLOGY

Current observation has been made on the water body that is Padalse Dam, (21.1869627°N and 75.0004005°E) in Amalner taluka of Maharashtra. Four different sites were decided for monthly records and observation of different groups of phytoplanktons.

The water samples for planktons were collected by plankton net of standard bolting silk cloth No- 24 (Mesh size 0.03 - 0.04 mm). Planktons were collected in between Nov 2016 to Oct 2017 for one year plan, every month of the sampling 100 liters of water sample was collected in different five by a plastic bucket (20 liters capacity each) from each site among all four. Finally, plankton sediment volume was adjusted to 30ml in the plankton net tub and preserved in 4% formaldehyde solution and 30ml sample, 4 bottles per month one for each site for each month sample was collected. The samples wear taken into laboratory for qualitative and quantitative estimation under the binocular stereoscopic microscope using a Sedgwick rafter type counting cell (1ml capacity) (Escaravage and Prins 2002 and Kumar). The entire organisms encountered were represented in absolute number. About ten counting of each sample were made and the data represented in the text were average values of the counting (Vyas, L.N. and Kumar, H.D. 1968, Zafar, A.R. 1967, Escaravage and Prins 2002 and Le Quere 2005).

The density of population of the four major groups of algae viz. Chlorophyceae, Cyanophyceae, Bacillariophyceae and Euglenophyceae were estimated seasonally from 2016 to 2014. The percentage of occurrence of three groups was calculated every month by taking their value from density population (Reynolds *et al.,* 2001 and Mustafa, S. and Zubair Ahmed 1997.).

RESULT AND DISCUSSION

The phytoplankton composition mainly from group like Chlorophyceae, Cyanophyceae, Bacillariophyceae and Euglenophyceae has been recorded in different recording sites of Padalse dam.

Table. 01: Padalse Dam **Site I** Nov-16 to Oct-17

	Components	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Total	Av
oup I	Chlorophyceae	111	151	124	129	140	163	90	116	127	269	225	216	1861	
oup II	Cynophyceae	105	115	99	98	110	110	99	75	69	98	145	155	1278	
oup III	Bacillariophycea	67	66	66	48	87	71	61	65	61	60	81	79	812	
oup IV	Euglenophyceae	7.5	13	8	7.5	12.5	13	14	12.5	8	11	12	11	130	
	Total	291	345	297	282.5	349.5	337.5	264	268.5	265	438	463	461	**4061.5**	

Table. 02: Padalse Dam Site II Nov-16 to Oct-17

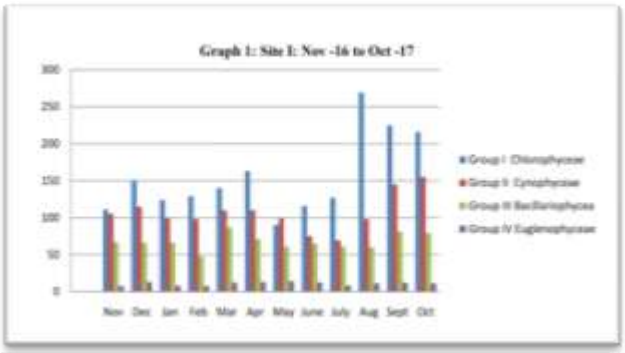
	Components	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Total	Aver
Group I	Chlorophyceae	99	81	95	81	98	122	122	89	104	224	127	146	1388	**11**
Group II	Cynophyceae	101	73	91	86	92	98	114	73	81	93	78	129	1109	9
Group III	Bacillariophycea	66	51	38	35	42	62	56	56	41	38	51	95	631	5
Group IV	Euglenophyceae	8.5	6	6	8	15	9	13	7.5	11	13	9	7	113	**9**
	Total	275	211	230	210	247	291	305	225.5	237	368	265	377	3241	

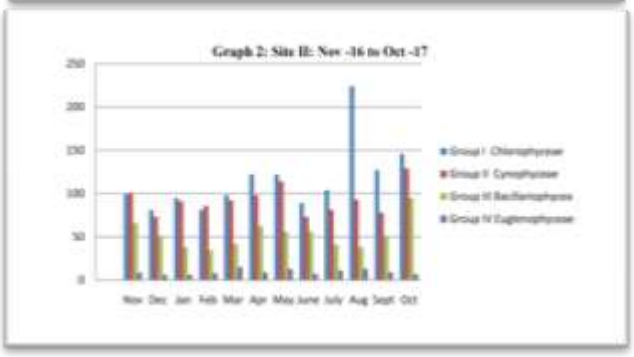
Table. 03: Padalse Dam Site III Nov-16 to Oct-17

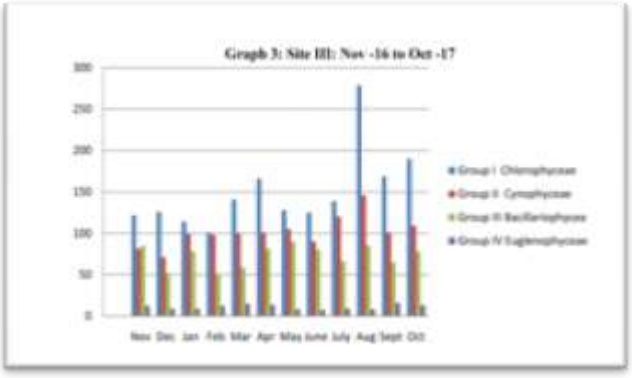
	Components	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Total	Av
oup I	Chlorophyceae	122	126	114	101	141	166	128	125	139	279	169	190	1800	
oup II	Cynophyceae	81	71	99	98	100	101	105	90	120	146	101	109	1221	
oup III	Bacillariophycea	85	52	78	51	58	81	90	80	66	85	65	78	869	
oup IV	Euglenophyceae	12.5	9	9	12.5	15	13.5	8.5	7.5	9	8	16	13	133.5	
	Total	301	258	300	262.5	314	361.5	331.5	302.5	334	518	351	390	4023.5	

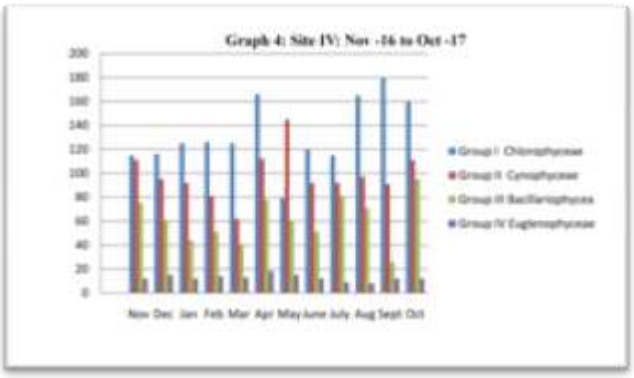
Table. 04: Padalse Dam Site IV Nov-16 to Oct-17

	Components	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Total	Aver
Group I	Chlorophyceae	115	116	125	126	125	166	79	120	115	165	180	160	1592	**132**
Group II	Cynophyceae	111	95	92	81	62	112	145	92	92	97	91	111	1181	98
Group III	Bacillariophycea	75	61	44	51	41	78	60	51	81	71	26	95	734	61
Group IV	Euglenophyceae	12	15	12	14	13	18	15	12	9	8	12	12	152	**12**
	Total	313	287	273	272	241	374	299	275	297	341	309	378	3659	









CONCLUSIONS

The current study had been discussed in relation to the variations of Phytoplankton composition, their frequency, dominancy of species in different months of the year with

variable physicochemical conditions. Presence of the four main groups of Phytoplankton viz. Chlorophyceae, Cyanophyceae, Bacillariophyceae and Euglenophyceae agrees with finding of (APHA, 2005 and Philpose, M.T. 1960) in other parts of India. Higher the diversity of phytoplankton species at the pollution free sites might be attributed to the more favorable environmental conditions. This may influence differently in dams and ponds due to incoming of water, evaporation of water and other anthropogenic actives. For instance, while there was lighter penetration due to low total dissolved solids; dissolved oxygen was high due to greater primary productivity.

It was observed that group Chlorophyceae has been remain dominant entire year in all four sites of observation in Padalse Dam. The abundance of Chlorophyceae is more dominant in month of July, August, September and October may due to the rainy season. As per Shannon weaver Index reflects the change in community brought about by the environmental (APHA, 2005). The present observation support to who opined that higher values of H indicate the absence of stress factor and the low values appear during monsoon (Komala *et al.*, 2013).

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