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RESEARCH ARTICLE

DIVERSITY AND MONTHLY VARIATION OF PHYTOPLANKTON IN KASAL POND OF WEST NIMAR, MP, INDIA

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ABSTRACT

The study of phytoplankton are the subject of great interest becomes phytoplankton is basic link of food chain in an aquatic ecosystem. The abundance of phytoplankton is more of less governed by the interaction of number of physical, chemical and biological process. There are significant in determining the pattern of fluctuation in yield of total plankton. The phytoplankton communities are species of the following groups Chlorophyceae, Bacillariophyceae, Cyanophyceae and Euglenophyceae has been observed in Kasal pond during study periods. A total 24 species belonging to four groups have been identified Chlorophyceae 11 species, Bacillariophyceae 8 species, Cyanophyceae 4 species and Euglenophyceae 1 species. The population density of phytoplankton varies from month to month and recorded maximum density 613 No./lit in the month of January and minimum density 189 No./lit in the month of August. The diversity of the different of phytoplankton in more winter seasons than summer and raining seasons.

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INTRODUCTION

Phytoplanktons are the autotrophic component and key part of ocean, seas and freshwater basin ecosystem. The name comes from the Greek word, phyton meaning "plant" and plankton meaning "wanderer" or "drifter". In aquaculture phytoplankton must be obtained and introduced directly. Phytoplankton is belonging to first trophic level. The environmental variables such as temperature, pH, nitrogen and phosphate play a decisive role in altering the phytoplankton density. Therefore present study was aimed at diversity and monthly variation phytoplankton observed in Kasal pond during one year.

Study area

The proposed study area i.e. Kasal pond, of Barwani district is situated in the south-western part of the state of MP. Kasal pond lies between 21°57'45" latitude and 75°3'16" longitude. It covers water area approximate 20hac. The average depth of the pond 6meter.The pond is rain fed during monsoon seasons. The water of pond is used to fish culture and also used for irrigation, domestic purpose.

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MATERIAL AND METHODS

The plankton samples were collected by standard plankton net made up bolting silk no. 25 (64μ). The concentrate was preserved in 5% formalin solution for phytoplankton study respectively. Smith (1950), Edmondson (1959), Adoni (1985) and Needan and Needan (1962) used for studied.

RESULTS AND DISCUSSION

The phytoplankton population is composed of four major groups namely Chlorophyceae, Bacillariophyceae, Cyanophyceae and Euglenophyceae in Kasal pond shown in Table- 1. The monthly variation of phytoplankton observed in the studied ponds depicated in Figure-1. The phytoplankton density are lowest value 189 no/lit and highest value 613 No./lit. Some species of Chlorophyceae were *Chlorella* sp., *Chara* sp., *Cosmarium* sp., *Oedogonium* sp., *Volvox* species foun dominant. Bacillariophyceae were *Amphora* sp., *Diatoma* sp., *Frugilaria* sp., *Synedra* sp., *Tabellaria* sp., *Novicula* species found dominant. Cyanophyceae were *Merismopedia* sp., *Spirulina* sp., *Oscillotoria* sp., *Anabaenopsis* species found dominant. The maximum phytoplankton density is recorded in January 2010 in Kasal pond. We were recorded Chlorophyceae (32.22%), Bacillariophyceae (38.52%), Cyanophyceae (22.45%) and Euglenophyceae (6.8%) shown in Figure-2.

Table 1. Monthly variation of Phytoplankton density in Kasal Pond (No./Liter) 2010-11

S.No.	Name of group and species	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	Annual Total	Mean	Status
	Chlorophyceae															
1	Ankistrodesmus sp.	5	8	6	8	10	15	20	11	5	4	8	10	110	9.2	A
2	Coelastrum sp.	6	4	6	6	12	14	25	12	2	2	9	9	107	8.9	A
3	Chara sp.	8	10	10	12	16	20	23	13	0	0	8	10	130	10.8	A
4	Chlorella sp.	12	8	8	15	16	32	40	24	4	5	12	13	189	15.8	A
5	Closterium sp.	12	10	8	8	10	16	20	8	5	4	8	10	119	9.9	A
6	Cosmarium sp.	16	6	6	7	10	20	25	18	6	8	10	12	144	12.0	A
7	Gonium sp.	6	6	5	6	6	8	15	8	3	3	8	8	82	6.8	C
8	Mougeotia sp.	0	0	0	0	0	6	12	10	6	10	2	0	46	3.8	R
9	Oedogonium sp.	12	8	10	10	12	18	25	10	0	2	10	12	129	10.8	A
10	Spirogyra sp.	5	3	3	10	10	15	20	8	3	2	10	12	101	8.4	A
11	Volvox sp.	8	6	6	10	12	14	20	22	5	5	10	12	130	10.8	A
	Total Species	90	69	68	92	114	178	245	144	39	45	95	108	1287		
	Bacillariophyceae															
1	Amphora sp.	7	8	10	12	15	35	50	22	40	20	10	10	239	19.9	A
2	Diatoma sp.	6	10	12	15	20	25	40	16	14	10	8	10	186	15.5	A
3	Frugilaria sp.	3	10	12	14	20	30	70	35	26	22	18	12	272	22.7	A
4	Frustulia sp.	2	6	8	12	16	18	22	20	19	16	14	13	166	13.8	A
5	Synedra sp.	3	8	11	12	20	20	24	30	20	14	12	13	187	15.6	A
6	Pinnularia sp.	0	2	8	0	0	16	0	0	10	15	0	0	51	4.3	R
7	Tabellaria sp.	6	10	14	17	20	24	28	15	12	12	12	11	181	15.1	A
8	Novicula sp.	15	20	25	24	28	30	35	20	17	10	19	14	257	21.4	A
	Total Species	42	74	100	106	139	198	269	158	158	119	93	83	1539		
	Cyanophyceae															
1	Merismopedia sp.	60	25	0	15	5	0	0	0	0	19	40	130	294	24.5	A
2	Spirulina sp.	16	10	5	8	10	12	16	20	25	20	16	15	173	14.4	A
3	Oscillatoria sp.	12	6	2	5	10	16	28	32	35	20	18	15	199	16.6	A
4	Anabaenopsis sp.	8	4	3	6	11	24	35	40	45	30	15	10	231	19.3	A
	Total Species	96	45	10	34	36	52	79	92	105	89	89	170	897		
	Euglenophyceae															
1	Euglena sp.	38	20	11	2	6	10	20	32	40	35	30	28	272	22.7	A
	Total Species	38	20	11	2	6	10	20	32	40	35	30	28	272		

A = Abundance,C = Common, R= Rare

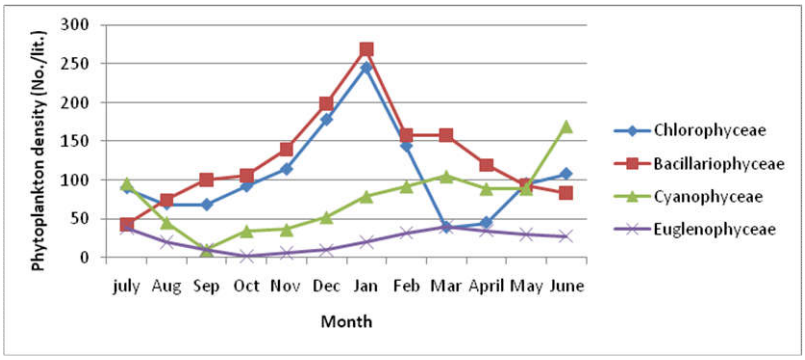

Fig 1. Monthly variation of Phytoplankton density in Kasal Pond (No./Liter) 2010-11

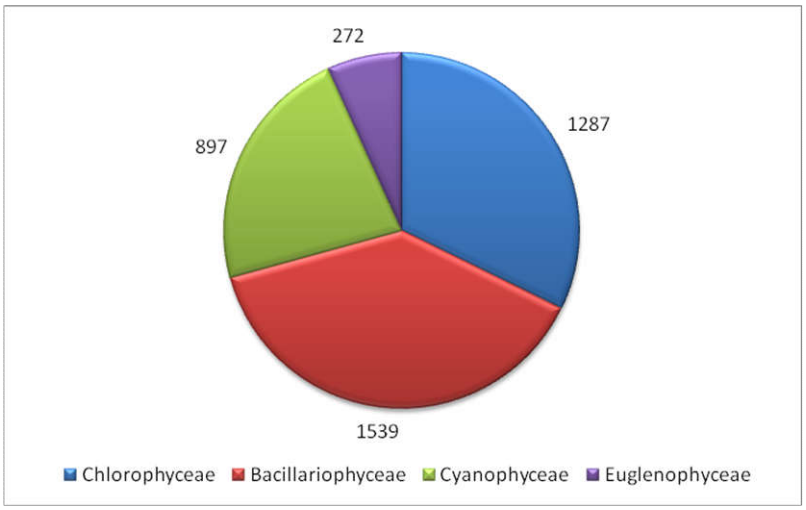

Fig 2. Yearly average of Phytoplankton Density in Kasal Pond 2010-11

A number of Bacillariophyceae are higher than other groups but species diversity of Chlorophyceae in higher than Bacillariophyceae. Phytoplankton diversity in freshwater ponds was identified by many researchers. Our findings are more or less similar to other researchers. The findings of this study are in agreement with the findings of Henery (2006).Verma and Shukla recorded 30 genera of phytoplankton from Kamala Nehru Tank, Muzaffarnagar, India. Chouhan (2008) recorded 35 species of total phytoplankton and maximum density observed winter month from five ponds of Barwani district. Hussain *et al.* (2007) found 17 genera belonging to Chlorophyceae (5 classes, 34.47%), Bacillariophyceae (3, 13.87%), Cyanophyceae (5, 34.48%) and Euglenophyceae (3, 10.68% and Dinophyceae (6.50%) from earthen fish ponds within the Rajshai region, Bangladesh.

Conclusion

The Phytoplankton community is represented by 4 class and 24 species. Density of the different group of phytoplankton is winter seasons maximum than during summer and rainy seasons. Phytoplankton plays many important ecological roles in aquatic ecosystem and effect human affairs in many ways. Planktonic algae are the primary producers of aquatic ecosystem and form the base that supports the zooplankton and fish of aquatic food webs.

REFERENCES

Adoni, A. D. and Vaishya, A.K. 1985. Phytoplankton productivity, seasonal, diel and vertical productivity in a central Indian reservoir, 32:219-228.

Chohan, P. 2008. Study of fish productivity in to fresh water ponds of Barwani districts M.P. (India). Ph.d. Thesis, Devi Ahiliya University Indore, M.P. 1-111.

Edmondson, W.T. 1971. Population dynamic and secondary production, Ereb. Limno. 8:56-64.

Henery, R., Nouueira, M.G., Pompeo, M.L.M. and Moschini Carlos, V. 2006. Annual and short term variability in primary productivity by phytoplankton and correlated abiotic factor in the Jurumirim reservoir. *Sao Paulo Braz. J. Biol.* Vol.66.no. Ib:pp-25.

Hossain, M.Y., S. Jasmin, A.H.M. Ibrahim, Z.F. Ahmed, J. Ohtomi, B. Fulanda, M. Begum, A. Mamun, M.A.H. EL-Kady and M.A. Wahab, 2007. A preliminary observation on water quality and plankton of earthen fish pond in Bangladesh. Recommendation for future studies. *Pak. J.Biol. Sci.*, 10:868-873.

Needhan, M. and Needhan, R. 1962. A guide to study of fresh water biology Holden day, San Francisco 108p.

Parag Deka and MM Goswami, 2015. Heleoplankton productivity at lower trophic level in two types of aquaculture ponds, Guwahati, Assam. *International Journal of Fisheries and Aquatic Studies,* 3(1): 57-61.

Sharmin Akter, Md. Mofizur Rahman and Masuma Akter 2015. Composition and abundance of phytoplankton population in fish ponds of Noakhali District, Bangladesh.

Smith, G.M. 1950. The fresh water algae of the united state. McGraw Hill, New York.

Verma, S.R. and Shukla, G.R. 1970. The physio-chemical condition of Kamala Nehru Tank, Muzaffarnagar (U.P.) in relation to the biological productivity. *Environment*, 12: 110-128.

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