PHYTOPLANKTON DIVERSITY OF MASANGHAT LAKE OF BHADRAWATI, MAHARASHTRA, INDIA

P. N. Nasare
NilkanthraoShinde Science And Arts College, Bhadravati, M.S., India.
Corresponding Author Email : Praveenkumarnasare@Gmail.Com

Abstract:

The present investigation is an attempt to study the phytoplankton diversity of Masanghatlake of Bhadrawati, Dist-Chandrapur, Maharashtra state, India during January 2013 to June 2013. The present paper deals with the phytoplankton diversity of Masanghatlake. During this study period, 47 genera of phytoplanktons were recorded. Out of 47 genera, 14 genera recorded for Cyanophyceae, 25 genera of Chlorophyceae, 07 genera of Bacillariophyceae were recorded and 01 genus of Euglenophyceae. Amongst four family members, Chlorophyceae members were found dominant and then Cyanophyceae, Bacillariophyceae and Euglenophyceae. Amongst CyanophyceaemembersNostocsp was found dominant. Amongst Chlorophyceae member, Volvoxsp was found dominant and AmongstBacillariophyceae diatoms were found dominant.Euglena was foundas sole member. This indicates, the plenty of phytoplankton flora in said lake and this will be significant to maintain ecological balance of that particular lake andwill be help for feeding zooplanktons and fisheswhich will maintain foodchain and sustainable ecological balance.

Keywords:

Masanghatlake, phytoplankton diversity, Bhadrawati

Introduction:

The Masanghatlake is located nearby to Nilkanthraoshinde Science and Arts college Bhadrawati. It is half kilometer from the college.The lake is called as Masanghatlake because nearby to lake there is a Hindu crematory site. This lake is providing bread and butter to Bhoicommunity which are regularly taking out crop of Shingada from this lake apart from rearing the fishes. Phytoplanktons are pioneer organisms of aquatic food chain. Phytoplanktons are primary producers which forms the base of an autotrophic food. They are of great importance as source of live food for zooplanktons and fishes. The productivity of an aquatic environment depends on the density of

phytoplanktons. The phytoplanktons has great significance as they provide the food for the organisms especially the zooplanktons. The physicochemical factors are directly related with their production. The phytoplankton is the base of most of the lake food webs and fish production is linked to phytoplankton. Moreover number and species of phytoplankton serves to determine the quality of water body. The production of phytoplankton is directly correlated with phosphate, silicate and nitrogen content of the lake waters. These three elements are essential for the bloom of phytoplankton and are always inversely proportional in an aquatic environment because the zooplanktons feed on the phytoplankton. It is the main item of food for many reservoir organisms like fishes, prolwns as well as mollusc's. Many researchers have published their work on aquatic environment and ecology of phytoplanktons of freshwater. Some of which include the work of George (1962), Kamat (1965) Barhate and Tarar (1981), Patil (1995), More and Nandan (2000), Bahura (2001), Borse et al., (2003), Nasare et al., (2009), Bhosale and Nasare (2010), Meshram and Nasare (2011). Therefore, it is very essential to study phytoplankton diversity time to time for this type of perennial water body for maintaining sustainable ecological balance. Therefore, Masanghatlake was undertakan for the study.

Material and Method:

The samples of phytoplanktons from three sampling sites from four directions of Masanghatlake were collected once in a month from the Masanghat lake during the period January 2013 to June 2013. The samples were collected in plastic bottles 250ml capacity from surface water. Lugol's iodine was used for preservation. The phytoplanktons were counted by drop count method (Lackey 1957). The phytoplanktons genera were identified by following, Edmondson (1965), Needham and Needham (1978), APHA (1998), and using some standard literature available. The results were expressed as number of organisms per ml.

Result and Discussion:

During the present investigation, 47 genera of phytoplanktons belonging to Cyanophyceae, Chlorophyceae, Bacillariophyceae and Euglenophyceae were recorded. Members of Cyanophyceaeviz.Anacystis, Anabaena, CylindrospermamGleotrichia, Gleocapsa, Lyngbya, Microcystis, Nostoc, Oscillatoria, Rivularia, Spirulina, Scytonema, Stigonema and Tolypothrix. Total fourteen genera were observed throughout the investigation period. Amongst them,Anabaena, Nostoc, OscillatoriaMicrocystis, Rivularia, Spirulina were found to be dominant. Amongst dominant genera,Nostoc was found to be most dominant. Members of Chlorophyceae viz. Chlamydomas,Cosmarium, Chara, Coleochaete, Chaetophora, Chlorelly, Cladophora, Draparnaldia, Eudorina, Fritschiella, HydrodictyonMougeotia, NitellaOedogonium, Pandorina, PediastrumPithophora, Protococcus, Scenedesmus, Spirogira, Stigeoclonium, Ulothrix, Vaucheria, Volox, Zygnema. Total 25 genera were observed throughout the study period. Amongst them, Chara, CeleochaeteStigeoclonium, Volvox, Zygnema, Nitella were found to be dominant. Amongst the dominant genera Volvox was found to be most dominant. Seven members of BacillariophyceaevizCyclotella, Cymbella, Diatoms, Navicula, Nitzschia, Rhopaldia, Synedra were recorded during the study period. Amongst them, Bacillariophyceaemember Diatoms were found to be most dominant. One member of Euglenophyceae was observed. Amongst the four groups of phytoplanktons, Chlorophyceae members were found to be common. In this particular study, trend was found to be Chlorophyceaemembers>Cyanophyceae members>Bacillariophyceae members >Euglenophyceae members (table-1). Kumawat and Jawale (2003) recoded 59 genera from fish pond at Anjale Maharashtra. Pawar et al. (2006) recorded 61 algal species from Pethwadi dam. These studies also showed that member of chlorophyceae were more prominent. Nasare et al. (2009), observed nine cyanophyeanmember during winter season. Bhosale and Nasare (2010) observed cyanophyean as well as chlorophycean members during winter and summer season. Meshramand

Nasare (2011) observed cyanophyean and chlorophycean members during winter and summer season. Zutschi et al. (1995) observed maximum population of blue green algae during summer while minimum during winter. Pendse et al. (2000), however, recorded maximum population of blue green alge during winter. Pendse et al. (2000) observed Euglenophyceae members in percolation tank of village Dasane, Maharashtra. Pendse et al. (2000) reported maximum Diatoms during winter months from percolation tank. ofDasane (M.S.). Sakhare (2002) reported 10 species of Bacillariophyceaefrompehwadaj dam. Sakhare and Joshi (2002) recorded 31 species of phytophycease from Yeldari reservoir, Maharashtra. Bahura (2001) studied phytoplanktons in a highly eutrophic temple tank situated near Bikaner Rajassthan. While Sirsat et al. (2004) recorded 24 genera of phytoplankton from a freshwater pond at Dhrmapuri in Beed district, Maharashtra. The results obtained during present study are in agreement with previous records.

Table-1: Phytoplankton diversity (No. oforganisms/ml) of Masanghat Lake, Bhadrawati, Maharashtra

Sr. No	Genera/Species	Months (Jan-2013 to June-2013)					
		Jan	Feb	March	April	May	June
A	CYANOPHYCEAE						
1	Anacystissp	37	22	12	09	03	02
2	Anabaena sp	52	48	32	31	21	17
3	Clindrospermumsp	25	23	17	13	09	06
4	Gloeotrichiasp	12	17	16	13	10	07
5	Gloeocapsasp	17	19	19	17	12	09
6	Lyngbya	13	09	07	06	05	01
7	Microaystissp	27	24	23	17	09	05
8	Nostocsp	62	57	48	19	10	07
9	Oscillatoriasp	51	50	33	17	13	05
10	Rivulariasp	32	29	19	11	10	07
11	Spirulinasp	30	29	21	17	12	09
12	Scytonemasp	32	25	19	10	11	02
13	Stigonemasp	27	22	17	11	09	03
14	Tolypothrixsp	28	21	17	12	09	03
	Total	445	395	300	203	143	85

Sr. No	Genera/Species	Months (Jan-2013 to June-2013)					
		Jan	Feb	March	April	May	June
B	**CHLOROPHYCEAE**						
1	Chlamydomonassp	22	17	13	09	05	02
2	Cosmariumsp	19	17	14	10	07	01
3	Charasp	32	30	27	15	12	03
4	Coleochaetesp	32	29	22	18	09	02
5	Chaetophorasp	22	17	13	07	05	01
6	Chlorella sp	19	17	12	09	07	02
7	Chadophorasp	12	11	12	07	08	03
8	Draparnaldiasp	05	07	05	03	02	01
9	Eudorinasp	18	17	15	13	11	07
10	Fritschiellasp	17	16	17	09	05	06
11	Hydrodictyonsp	15	15	13	07	05	03
12	Mougeotiasp	23	17	13	12	07	02
13	Nitellasp	25	23	19	11	09	07
14	Oedogonimsp	23	19	16	13	12	09
15	Pandorinasp	17	13	12	09	07	02

Sr. No	Genera/Species	Months (Jan-2013 to June-2013)					
		Jan	Feb	March	April	May	June
16	Pediastrumsp	19	13	09	05	06	03
17	Pithophorasp	20	13	12	09	07	02
18	Protococussp	13	11	12	07	03	02
19	Scenedesmussp	15	12	09	05	06	05
20	Spirogyra sp	23	17	17	09	08	07
21	Stigocloniumsp	24	23	19	10	09	05
22	Ulothrixsp	17	14	15	11	09	07
23	Vaucheriasp	19	15	13	11	05	03
24	Volvoxsp	32	30	28	22	05	03
25	Zygnemasp	30	21	17	09	05	06
	Total	**513**	**434**	**574**	**250**	**174**	**94**

Sr. No	Genera/Species	Months (Jan-2013 to June-2013)					
		Jan	Feb	March	April	May	June
C	**BACILLARIOPHYCEAE**						
1	Cyclotellasp	12	10	07	02	02	00
2	Cymbellasp	17	11	09	05	01	01
3	Diatom sp	52	49	33	29	18	16
4	Naviculasp	09	07	07	02	01	00
5	Nitzschiasp	07	07	05	03	02	01
6	Rhopaldiasp	07	03	05	01	01	00
7	Synedrasp	05	04	03	02	00	00
	Total	**109**	**91**	**56**	**44**	**25**	**18**
D	**EUGLENOPHYACAE**						
1	Euglena	13	09	07	03	02	0

Conclusion:

In the present study, Chlorophyceae member were found dominant in the reservoir while Euglenophyceae member were found scanty Cyanophyecaae and Bacillariophyceae member were also found in adequate numbers. The algal members were found in following order viz. chorophyceae (25) >cyanophyceae (14) >bacillariophyceae (7) >euglenophyacae (01).

Acknowledgement:

The author is thankful to Late Dr. K.D. Thengane, Principal Nilkanthraoshinde Science and Arts collegeBhadrawati for providing laboratory facilities. The author is also thankful to Dr. S.R. Sitre for helping and identifying the phytoplanktons. The author is very much thankful to Mr. N.Y. Shinde (Ex-MLA) BhadrawatiShikshanSanstha, Bhadrawati for providing all resource material and helping in all the ways.

Reference:

APHA (1998) : Standard methods for the Examination of water and waste water, 20th Edition, APHA, AWWA and WEF, Washington D.C.

Borse, S.K., Lohar, P.S. and Bhave, P.V. (2003): Hydrobiological study of algae and Aner River, Jalgaon, Maharashtra, India, J. Aqua. Biol. 18 (1) : Pp15-18.

Bahura, C.K. (2001) :Phytoplanktonic community of a highly eutrophicated temple tank Bikanaer, Rajasthan. J. Aqua. Biol. 16: (1&2) Pp 1-4.

Barhate, B.P. and Tarar, J.L. (1981) : Algal Flora of tapi rivers, Bhusaval, Maharashtra, Phykos. 20 : Pp. 75-78.

BhosaleDarshana and Nasare, P.N. (2010) : Phytoplankton diversity of Sakkardara Lake, Nagpur (M.S.) Bioinfolet 7(4): Pp317-319.

Edmondson, W.T. (1966) : Freshwater Biology 2nd Edition, John Wiley and Sons Inc. New Delhi.

George, M.S. (1962) : Occurrence of a permanent algal bloom in a fish tank at Delhi with special reference to factors responsible for its production. Pro.Indian.Sci Acad. 56 : Pp. 354-362.

Kamat, N.D. (1965) : Ecological notes on on algae of Kolhapur. J. Biol. Sci. 8 : Pp. 47-54.

Kumavat, D.A. and Jawale, A.K. (2003) : Phytoplankton Ecology of a fish pond at AnjaleDistt. Jalgoan (M.S.) J. Eco.Env. And Cons 9(3) :Pp 4-11.

Lackey, J.B. (1957) : Transactions of a semimar on the biological problem in water pollution research. A Texax sanitary Engg center, Cincinnati, Ohio, 50.

More, Y.S. and Nandan, S.N. (2000) :Hydrobiological study of algae of Panzar a river (Maharashtra). Ecol. Ecol. And cons. 6(1): Pp. 99-103.

MeshramManisha and Nasare, P.N. (2011) : Phytoplankton diversity of Futala Lake in Nagpur, Maharashtra Ecology and FiseriesVol 4(1) : 67-70.

Needham, J.G. and Needham K.R. (1978) : A guide to the study of freshwater biology Holden day Inc. Pus. San.FransciscoPp 107.

Nasare, P.N., Wadhave, N.S. Harney, N.V. and sitre. S.R. (2009) : Studies on phytoplankton diversity of Vinjasan Lake in Bhadrawati town of chandrapur district Maharashtra. Ecology and Fishesies Vol. 2(1): Pp 95-100.

PatilSandhya (1995) ; Algal flora of polluted water of Khandesh of Maharashtra, Ph. D. Thesis, Poona University Poona.

Pendse, D.C. YogeshShashtri and Barhate C. (2000): Hydrobiological study of percolation tank of village Dasane. Eco.Env. and Cons. 6(1) : Pp93-97.

Pawar, S.K., Pulle, J.S. and Shende, K. M. (2006) : The fish fauna of pethwades dam talukaakandhar in Nanded District, Maharashtra, India.L.V. Aqna. Biol. 21(2) :Pp 55-58.

Sakhare, V.B. (2002) : Studies on some aspects of fisheries management of Yeldari reservoir, Ph. D Thesis, S.R.T.M. University Nanded, India.

Sakhare, V.B. and Joshi, P.K. (2002) : Reservoir fishery potential of Parbhani district, Maharashtra Fishing chimes. 23(5) ; 13-16.

Sirsat, D.B., Ambhore, N.E. and Pulle, J.S. (2004):Study of phytoplankton of fresh water pond at Dharmapuri in Beed District (Maharashtra). J Aqua Biol 19(2) : Pp7-10.