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STUDY OF PHYTOPLANKTON STATUS INDICATOR SPECIES OF KAVA LAKE NEAR LATUR DIST LATUR [M.S.] INDIA

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ABSTRACT

The phytoplanktons were used to evaluate the water quality of Kava lake near Latur.The pollution indicator genera of algae from three (3) stations of lake were recorded; this was done with the help of palmer's index of pollution indicator species of algae. For knowing the quality of water samples the total score of station were recorded greater than 09 pollution status indicator species out of the 34 pollution indexed speices of palmer were recorded from Kava Lake.which helped to know the high degree of organic pollution of Kava Lake. The 23 genera observed at different stations from Chlorophyceae, Cyanophyceae ,Bacillariophyceae and Euglenophyceae during the study period January to December 2019.

INTRODUCTION

Bioindicator are groups of organisms that show signs that they are affected with environmental pressure because of human activities or the destruction of biotic system (Mc Geoch, 1998).Algae existence are caused due to by domestic stress, resulting in a variety of changes in the aquatic systems. Algae can serve as bioindicator of the degree of pollution. Kolkwitz and Marsson (1908) were few who set a trend they classified algal species based on their tolerance to various kinds of pollution. They stated that the presence of certain species of algae could define various zones of dispossession in a river. Palmer (1969) published a composite rating of algal species that could be used to indicate clean and polluted waters.

In Marathwada region there are many Lakes, but very less consideration has been paid to presence of Phytoplanktons in water and water pollution. In the present investigation the pollution status of Kava Lake near Latur in Maharashtra State is checked with the help of palmer's pollution indicator algae (Planktons). The Kava Lake is located near Latur city which is away 3.6 Kms from Latur in South direction. The Kava Lake region of North Longitude 18⁰23'58" and East latitude and 76⁰34'50". In the present investigation the water of Kava Lake was analysed for Physicochemical parameters like Temperature,pH, D.O, C.O.D, Hardness, Chlorides and Salinity ,Total dissolved solids etc were analysed some attention is paid to this waterbody it can help the residents of latur for water supply near to the lake.

MATERIAL AND METHODS

The water samples were collected fourth nightly in third week of every month for physicochemical and Plankton analysis from 3 stations, Station A-College end, Station B-Kava end, Station -C- Village end from Kava Lake for one year (January to December 2019). The water samples were collected in the 5 lit. acid cleaned plastic pot.

The DO, Temperature, pH were recorded at Stations. DO was fixed at the stations itself and further analyzed in the laboratory. The water temperature was recorded by the Thermometer; pH was

examined with the help of pH strips and by digital pH meter in laboratory. The standard methods for water analysis were followed according to APHA (1998) Trivedi and Goel, 1987).

For biological parameters the plankton net no.25 was used .This net was immersed in surface water up to 20 cms. The 50 liters water was filtered and this filterate with planktons were collected in plastic bottles.. This was centrifuged and supernatant was removed and rest was preserved with 3 % formalin solution and used for plankton analysis . For identifying the plankton the standard keys were used.

RESULT AND DISCUSSION

According to the guidelines provided by palmer (1969) the algae are the most pollution tolerant individuals. Thus with the help of this pollution indexed species assessment of the quality of whichever water body is possible. The palmer's indexed algae were recorded from three stations and tabulated in table no 1 and 2. In the present investigation 23 genera from all types of Phytoplanktons were recorded out of which nine genera were in the list of Palmers pollution indicator algal species. The dominance of the indicator algae /Planktons like Euglena ,Navicula Nitzischia,Spirulina,Scenedesmus clearly indicates towards the organic pollution in the Kava Water body. As it is well known fact given by Palmer (1969) who has showed, the algal genera Euglena, *Oscillatoria*, scendesmus, Navicula, Nitzschia are found in organically polluted waters reported by Goel et.al (1986); More and Nandan (2000); Nandan and Aher (2005) Raut et.al (2010) Khalid Dheyaa Abdulwahid (2016). Similar genera were recorded in the present investigation. The present species list mentioned above except oscillatoria correlates findings of Bhowmk et. al (1993)Asep Sahidin et.al (2019)

In the present investigation different types of Phytoplanktons were found. The water in the months of winter season was more greenish in colour while it was less greenish in Summer

and in Monsoon it was found to be turbid due to rain. The blooms of different types of Phytoplanktons were recorded which trigger to the organic polluted condition of this Lake. According to Palmer the algal blooms indicate towards the pollution.

Table No.1 Composition of Mean Phytoplankton Genera from three Stations.

Sr.No	Class of Plankton/Algae	Genus/ degree of existence	Planktons/ ml.[Winter +Summer+ Monsoon]	Pollution Index
1.	**Chlorophyceae**	Ophiocytium*	122	-
2.		Richteriella***	933	-
3.		Selenastrum***	690	-
4.		Tetraspora**	540	-
5.		Akistrodesmus**	420	2
6.		Cosmarium**	370	-
7.		Pediastrum***	680	-
8.	**Cyanophyceae**	Nostoc***	1030	-
9.		Spirulina*****	2733	-
10.		Aphanocapsa***	1056	-
11.		Microcystis****	1890	-
12.		Phormodium***	1250	1
13.		Anabaena***	1133	
14.		Oscillotoria***	1245	2
15.	**Bacillariophyceae/Diatoms**	Synedra***	1460	2

16.		Scenedesmus***	1654	4
17.		Nitzschia*****	2430	3
18.		Stephanodiscus***	1040	-
19.		Cycotella**	1760	1
20.		Asteroinella*	220	-
21.		Navicula**	840	3
22.		Tabellaria**	770	
23.	Euglenophyceae	Euglena*	321	5

Table No. 2 Mean Water Quality Range of Kava lake from three stations

| Sr.No	Type of Physicochemical parameter	Range	Permissible limits by ISI, WHO etc.
1	Colour of Water	Faint green to dark green	Colourless
2	pH	7.5-8.7	Beyond 8.5 it will affect on Mucous membrane.
3	Water Temperature	19-33 ^{0}C	---
4	T.D.S	75-528 mg/l	500 mg/l
5	Total hardness Hardness	190 - 490 mg/lt	Above 300 mg/l
6	Dissolved Oxygen	2.3 - 6.2mg/l	Less than 5 mg/l
7	Chemical oxygen demand	6.0 -12.1 mg/l	Less than 5mg/l
8	Chlorinity	141.8- 304.87 mg/l	Above 350 mg/l
9	Salinity	256.37-552.204mg/l	Above 600 mg/l

PROFUSION OF ALGAE

Plankton presence was used in determining water quality . After the completion of work identification of algae in lake were found in 4 classes as Chlorophyceae (7 genera), Cyanophyceae (7 genera), Basillariophyceae (8 genera) and Euglenophyta (1 genus) total 23 genera tabulated in Table no.1. The profusion of the maximum genus in phytoplankton species was the Bcillariophyceae , followed by Cyanophyceae then Chlorophyceae and Euglenophyceae.

Different types of phytoplanktons were at hand in lake showed the following seasonal divergence during study period 2019.January 2019 to December 2019.

Summer:. Cyanophyceae >Bcillariophyceae>Chlorophyceae > Euglenophyceae
Mansoon: Bcillariophyceae> Cyanophyceae>Chlorophyceae > Euglenophyceae.
Winter: Bcillariophyceae> Cyanophyceae>Chlorophyceae > Euglenophyceae
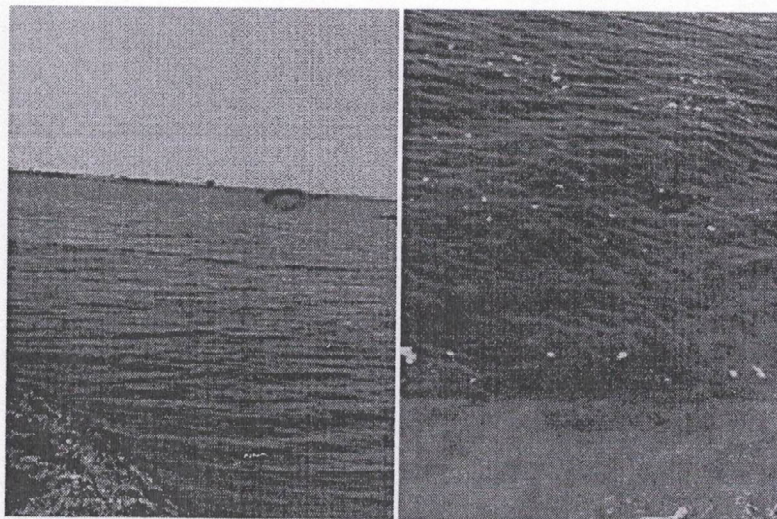
Figure 1 Sampling Station -A College endFigure 2.Sampling station B –Kava end
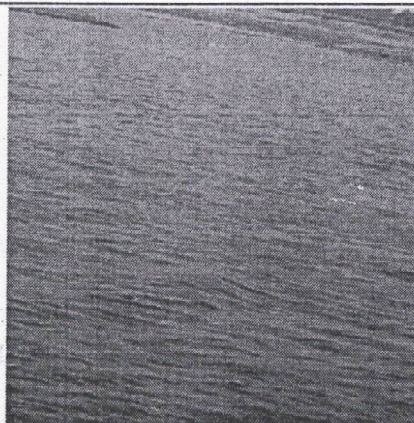
Figure 3 Sampling Station –C Village end

REFERENCES

1] **A.P.H.A. 1998.** Standard methods for the examination of water and waste water. 20th edition. APHA, Washington USA.

2] **Asep Sahidin*,** Isni Nurruhwati2, Zahidah3, Heti Herawati4. Phytoplankton as bioindicators of pollution status in Cirata Reservoir, Indonesia 2019. International Journal of Fisheries and Aquatic Research , Volume 4; Issue 1; January 2019; Page No. 01-05

3]**Bhowmik M.L., Sarkar, U.K. and Pandey, B.K. 1993.** Plankton abandance and composition in sewage fed fish pond. J. Inland Fish Soc. India, 25 (1): 23-29.

4] **Goel, P.K., Khatavkar, S.D., Kulkarni, A.Y. and Trivedy,R.K. 1986.** Limnological studies of a few fresh water bodies in south western Maharashtra with special reference to their chemistry of phytoplankton poll. Res., 5(2): 79-84

5] **Kolkwitz R, dan Marsson M. Oekologie der pflanzlichen Saprobien. Berichte der Deutschen Botanischen Gesellschaft. 1908;**26:505–519. [Google Scholar]

6] **Palmer CM. 1969.** A composite rating of algae tolerating organic pollution. Journal of Phycology. 1969;5(1):78–82. [PubMed] [Google Scholar]

7] **More Y. S. and Nandan, S.N. 2000.** Hydrobiological study of algae of Panzara rive (Maharashtra); Ecol. Env. Cons., 6(1): 99-103.

8] **Nandan S.N. and Aher, N.H. 2005.** Algal community used for assessment of wate rquality. J. Environ. Biol.26(2): 223-227.

9] **McGeoch, M.A. 1998.** The Selection, Testing & application of Terrestrial Insects as Bioindicators. Biol. Rev., 73: 18- 201.

10] **NWONUMARA, Godwin Nkwuda 2018.** Water Quality and Phytoplankton as Indicators of Pollution in a Tropical River. Proceedings of 6th NSCB Biodiversity Conference; Uniuyo 2018 (83 – 89 pp)

11] **Khalid Dheyaa Abdulwahid (2016).** Assessment of water quality in khreisan river from baquba city, diyala (iraq) by using algae as a bioindicator , International Journal of Current Research Vol. 8, Issue, 06, pp.33108-33115, June, 2016

12] **Raut, K.S., Kachare, S.V., Pathan, T.S., Shinde, S.E., Dabhade, V.F. and Sonawane, D.L.** Utilization of algae as pollution indicators of water quality at nagapur and chandapur dams near parli. v. town dist. Beed Maharashtra, indiaInternational Journal of Current Research Vol. 4, pp. 052-054, May, 2010

13] **Trivedi R.K.and Goel P.K. 1987.** Chemical and biological methods for water pollution studies. Environmental publications Karad, India.

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