BRIEF COMMUNICATION

DIVERSITY OF ALGAE IN RELATION TO WATER POLLUTION OF SATRI TANK CHHATARPUR (M.P.) INDIA

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ABSTRACT

This paper is report of phytoplankton from Satri Tank of Bundelkhand region, India. Total 43 species and 27 genera have been identified from Satri Tank, among these 18 species belonged to Chlorophyceae, 17 species to Cyanophyceae, 6 to Bacillariophyceae and 2 to Euglenophyceae. Qualitatively Chlorophyceae were dominant while quantitatively Cyanophyceae were abundant. The species of *Spirulina, Oscillatoria, Microcystis* and *Nostoc* were dominant. The tank is indicative of highly eutrophic status and biologically dead in term of its unability to provide the aesthetic pleasure of swimming, boating and fishing.

Key words: Lower plant, Phytoplankton, Eutrophic.

INTRODUCTION

Satri Tank situated in latitude $26^0 6'$ and $25^0 20'$ north and meridians of longitude $78^0 59'$ and $80^0 26'$ east. It was built in 1933 and is popular for fish farming under the special program of fishries development "CRASH" and now facing the problem of organic pollution due to major discharge of raw sewage, detergents, excremental matter and also receives wastes from adjoining human settlements. Tank has an average maximum depth 1.2 m and emanates foul smell in summer season due to effluent accumulation there by causing health hazards to the surrounding human population.

MATERIALS AND METHODS

Water samples were collected twice in a month of year 1999. They were analysed for physico-chemical and biological parameters (Adoni 1985, Trivedi and Goel 1986, Michael 1973). Plankton samples were collected by standard methods from predetermined sampling sites and preserved in 2.5% formalein and few drops of glycerine. Counting and identification of plankton were done as per APHA (1985).

RESULTS AND DISCUSSION

Phytoplankton population was mainly represented by chlorophyceae, cyanophyceae, Bacillariophyceae while members belonging to euglenophyceae were sparsely represented. A total number of 43 species belonging to 27 genera were identified. Cyanophyceae was represented by 17 species (39.28% of total phytoplanktons species) while chlorophyceae exhibited 27.96% of total phytoplanktons. Bacillariophyceae represented 6 species and euglenophyceae represented only two species (Figs. 1, 2, Table 1).

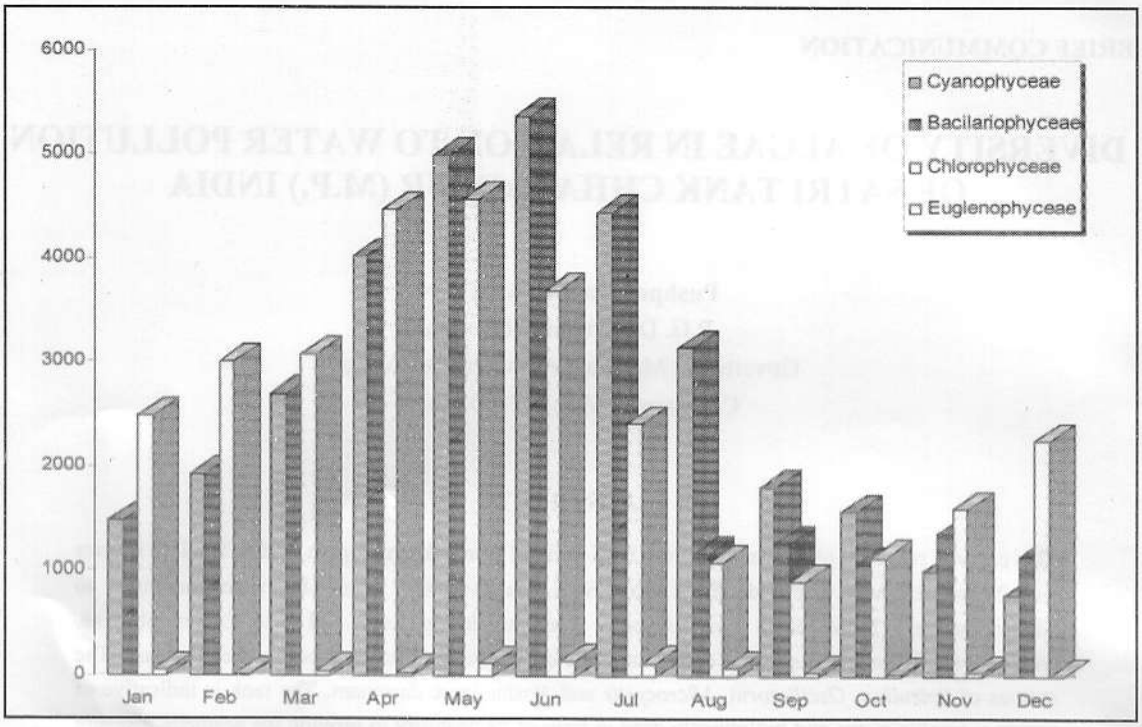

Fig. 1. Seasonal variation of phytoplankton (Org./l) in Satri Tank, Chhatarpur (M.P.) from January to December 1999.

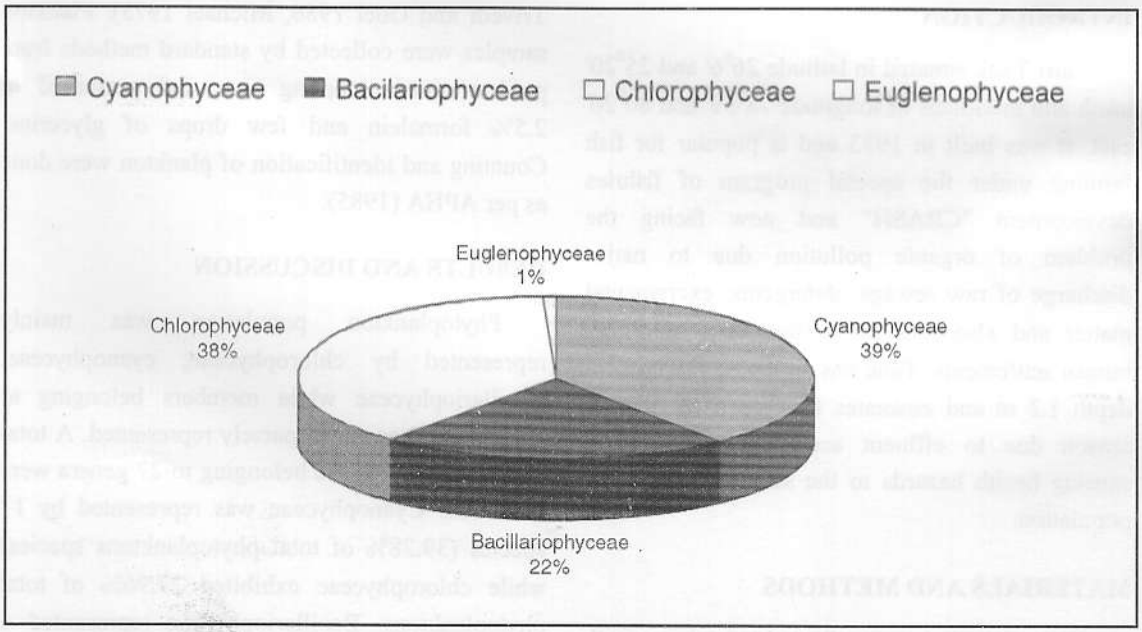

Fig. 2. Average composition (%) of phytoplankton's in Satri Tank, Chhatarpur (M.P.) India during January to December 1999.

Table 1. Number of different algal groups in the Satri tank, Chhatarpur.

Class	Order	Genera	Species
Chlorophyceae	Volvocales	1	1
	Chlorococcales	4	8
	Conjugales	3	4
	Desmidiales	3	5
Euglenophyceae		1	2
Bacillariophyceae		6	6
Cyanophyceae	Chroococcales	1	2
	Nostocales	8	15
		27	43

The number of species belonging to a total of 27 genera recorded and the size of the respective population varied according to seasons as well as sites. Chlorophyceae was the dominant class with 18 species. It was followed by cyanophyceae having 17 species while bacillariophyceae and euglenophyceae having 6 and 2 species, respectively. Among the chlorophyceae, the most dominant group was cholrococcales comprised 8 species. Next to chlorococcales was desmidales represented by 5 species. The other orders in the descending series, conjugales (4) and volvocales (1).

Through the bacillariophyceae were represented by smaller number of species as compared to chlorophyceae and cyanophyceae, yet they dominated sufficiently in a large number round the year (Table 2) chlorophyceae ranked second when total number of individuals had been taken into accound, followed by cyanophyceae and euglenophyceae.

The most dominant species recorded from cyanophyceae were: *Spirulina, Oscillatoria Microcystis* sp., while from chlorophyceae, *Eudorina, Pandorina, Scenedesmus, Cosmarium, Closterium* and *Pediastrum*.

The presence of *Closterium, Cosmarium* and *Pediastrum* shows that the nature of tank is mesotrophic but the dominance of *Eudorina, Pandorina* and *Scenedesmus* sp. indicates eutrophic nature (Khare 1999). *Scenedesmus* sp. gives an idea about eutrophic water body. *Pandorina* sp. indicate pollution and eutrophication (Mittal and Sengar 1991). In this study dominant algae indicates that Satri Tank is eutrophic. The dominancy of *Spirulina* and *Microcystus* sp. in the tank are categorised as highly eutrophic.

Hutchinson (1967) reported that *Melosira* and *Fragilaria* indicate oligotrophic nature of waterbody but *Navicula* is usually found in alkaline water. Rawson (1956) said that eutrophic lakes characterised by diatomaceae. In present investigation on the basis of diatomaceae these tank come under meso-eutrophic status.

On the basis of these results Satri Tank is catagorised highly eutrophic in the presence of dominant cyanophycean member such as *Spirulina, Microcystis, Oscillatoria* and dominant chlophrophycean member *Eudorina, Pandorina* and *Scenedesmus* sp.

Table 2. Seasonal variation of phytoplanktons (orga./l) in Satri Tank Chhatarpur (M.P.) India. Figures in parentheses represent percent composition of total phytoplanktons.

Genus	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Cynophyceae	1465	1917	2696	4019	4986	5362	4450	3134	1793	1553	996	783
	(32.04)	(33.36)	(38.34)	(39.4)	(38.89)	(45.49)	(53.15)	(57.44)	(44.84)	(41.08)	(25.03)	(18.68)
Bacilariophyceae	562	804	1216	1669	2236	2584	1375	1160	1258	1064	1351	1143
	(12.29)	(13.99)	(17.29)	(16.36)	(17.44)	(21.92)	(16.42)	(21.26)	(31.46)	(28.14)	(33.95)	(27.27)
Chlorophyceae	2484	3004	3067	4473	4574	3690	2414	1078	903	1130	1587	2252
	(54.34)	(52.28)	(43.62)	(43.86)	(35.37)	(31.3)	(28.83)	(19.75)	(22.58)	(29.89)	(39.88)	(53.74)
Euglenophyceae	60	20	52	37	124	151	134	84	44	35	45	12
	(1.31)	(0.35)	(0.74)	(0.36)	(0.96)	(1.28)	(1.60)	(1.54)	(1.10)	(0.87)	(1.13)	(0.28)
Phytoplanktons	4571	5745	7031	10198	12820	11787	8373	5456	3998	3780	3979	4190

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