DIVERSITY OF CYANOPHYCEAE IN KAYAMKULAM BACK WATER, KERALA

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ABSTRACT: The present investigation "Diversity of cyanophyceae in kayamkulam back water, kerala" was carried out for six months from August 2015 to January 2016.Plankton were collected monthly using plankton net(60µ).During the whole study period total 8 genera of cyanophyceae were recorded, of which *oscillatoria, Arthrospria sp*, were found to be the most Frequent. The highest diversity was recorded at the station I and the lowest diversity recorded at the station III. Standard procedures are adopted for determination of physic-chemical parameters of water viz; temperature, salinity, DO, BOD, P^H etc. and found that directly influence the cyanophyceae diversity. The higher population of cyanophceae were recorded at the station I with increased level of BOD along with low DO level.Analysis shows some pollution tolarent genera of cyanophyceae like *Oscillatoria ,Microcystis,* hence there is need of regular monitoring of water is essential.

KEY WORDS: Cyanophyceae, *Oscillatoria*, *Arthrospria*, Kayamkulam, Backwater

INTRODUCTION

Planktonic study is very useful tool for the assessment of water quality and productivity of any type of water body[11] Planktons, particularly; phytoplankton was used as indicators of water quality[2]. Phytoplankton the most important biological phenomenon in nature on which the entire array of life depends is the integral component of riverine ecosystem, which determines the primary productivity of the system. It is the bio-indicators of water pollution. Its appearance, disappearance, density and pattern of distribution depend on biotic and a biotic factors[5,6,7,9].

The cyanophyceae are unicellular, colonial or filamentous, that found throughout the world. They are naturally occur in aquatic ecosystem and are true bacteria that function like algae. They commonly are referred to as "Blue green algae" and are photosynthetic organisms like green plants that consume carbon dioxide and produce oxygen and same time able to fix atmospheric nitrogen. During the recent studies, cyanophyceae have emphasized their important role in ecosystem. They grow at any place and in any environment where moisture and sunlight are available.

The Cyanophycean density and

diversity of surface waters of various water bodies have been studied by a number of investigators[12], Studies made on cyanophyceae of kayamkulam back water is limited. A very few literature has been found on the plankton community of kayamkulam back water such as Mary John[10] and Amina[1]. Thus, the present study was done to find out the diversity of Cyanophyceae in kayamkulam back water.

STUDY AREA

The kayamkulam back water with an area of 1652 ha is typical estuary (lat 9^0 09 and $9^0$15 N long 76^0 02 and $76^0$28'E) located in the western part of kayamkulam town laying parallel to the Lakshadeep sea. The lake has been exposed to much anthropogenic influence in recent past. This investigation was made six months from selected three stations.

Station I : Ayiramthengu

This represents an isolated mangrove area of 20 acres situated on the banks of kayamkulam estuary. The rich and diversified life of the ecosystem paved the way for the establishment of mullet fish farm by government in this area.

Station II : valiyazhikkal

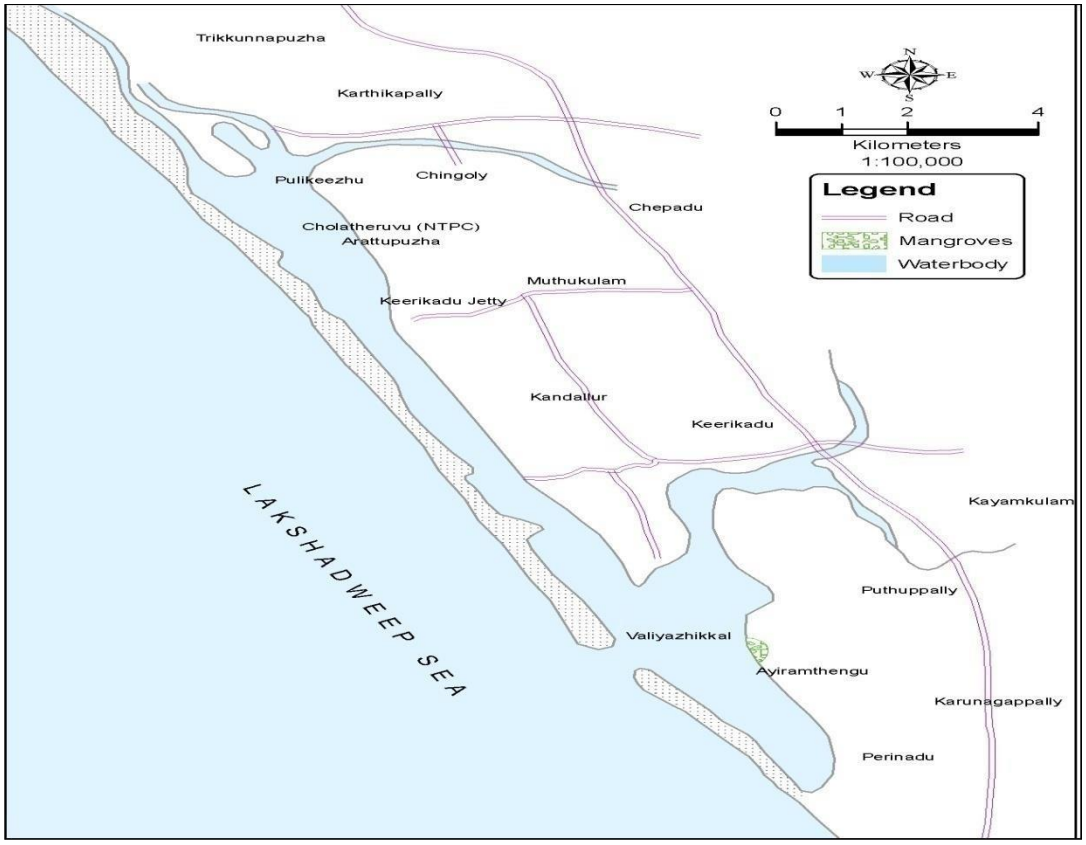
The station is of prims importance as the lake is concerned the lake opens to the sea and drins its water through a natural pozhi at valiyazhikkal

Station III : Choolatheruvu

Table 1. Physico-chemical parameters of surface water of kayamkulam back water

Parameters	Sampling stations		
	Station I	Station II	Station III
Air Temperature (^{0}C)	25.8	27.2	27.9
water Temperature (^{0}c)	27.6	25.7	28.1
p^H	7.64	7.32.	7.66
Dissolved oxygen (mg/l)	2.09	4.24	4.22
Free carbondioxide (mg/l)	1.02	1.28	0.17
Salinity	30.9	20.9	33.81
Total hardness (mg/l)	5432.3	3328.5	6333.8
Biological oxygen Demand	2.06	1.91	1.76

It is on northern end of the lake on the side NTPC. It is the site of discharge of hot water from the power Plant



MATERIALS AND METHODS

Monthly field collection was carried out from August 2015 to January 2016, three stations was surveyed. Various physic-chemical factors such as temperature, DO, carbon dioxide, salinity, hardness, p^H, BOD are determined by using standard methods (APHA 2005)[2].

The water samples containing cyanophyceae were collected and filtered by using plankton net of mesh size 60µ size and preserved. Collections from the three stations were made between 8 to 10 am. Different cyanophyceae genera was identified with the help of keys given in Prescott (1962), Sharma and Khan (1980).

RESULTS AND DISCUSSION

The various physic-chemical parameters of water recorded during the whole study period are given in Table 1 and all cyanophyceae genera recorded from Kayamkulam back water are presented in Table 2 and monthly percentage variations of Cyanophyceae in kayamkulam back water recorded in Table 3.

Table 2. Cyanophyceae genera recorded from the surface water of three sampling stations of kayamkulam back water

Sl.No	Cyanophyceae genera	Station I	Station II	Station III
1.	*Anabaena sp.*	+	+	+
2.	*Arthrospria sp.*	+	+	+
3.	*Gomphospaeri sp.*	+	-	-
4.	*Merimopedia sp.*	+	-	-
5.	*Microcystis sp.*	-	+	-
6.	*Nostoc sp.*	+	+	+
7.	*Oscillatoria sp.*	+	+	+
8.	*Spirulina sp.*	+	+	+
Total numbers		7	6	5

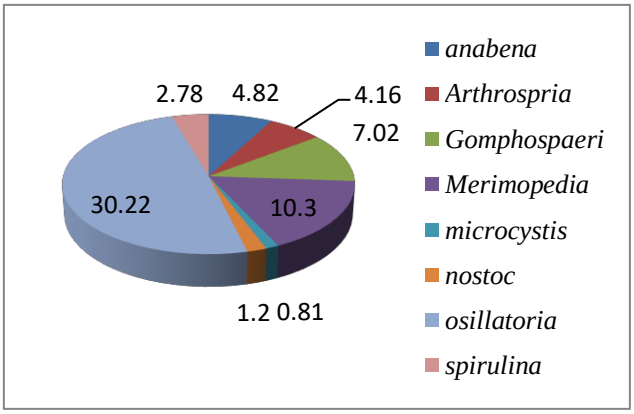
+ present,- absent

Result shows that cyanophyceae population was found to be influenced by physic-chemical parameters of water in the lake. It was reported by many workers that high values of BOD with very low Dissolved oxygen (DO) favoured the growth of cyanophyceae. In the present study also, the higher population of Cyanophyceae were recorded at the Sites with increased level of BOD along with low DO level. Temperature and P^H of water is directly influence the cyanophyceae diversity. All cyanophyceae genera recorded from kayamkulam back water are presented in Table 2. Total 8 genera of cyanophyceae identified. Among those *Oscillatoria* the most dominent genera in 3 stations and reported to be very tolerant to pollution[3]. Some useful genera like *Anabaena sp.* and *Nostoc sp.* are also present, which reported to be involved in bioremediation[8]. Colouration causing genera like

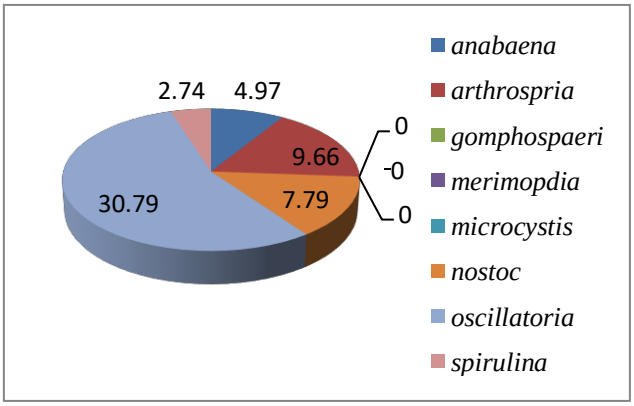
Table 3. Monthly percentage variations of Cyanophyceae in kayamkulam back water

Cyanophyceae genera	**Station I**							**Station II**							**Station III**						
	Aug	Sep	Oct	Nov	Dec	Jan	Total	Aug	Sep	Oct	Nov	Dec	Jan	total	Aug	Sep	Oct	Nov	Dec	Jau	Total
Anabaena	0.00	0.00	0.00	2.08	1.29	1.45	4.82	0.00	0.00	0.00	2.0	1.0	9.0	12	0.0	0.0	0.0	2.08	1.20	1.69	4.97
Arthrospria	0.00	0.00	0.00	0.00	0.00	4.16	4.16	0.00	0.00	7.02	0.00	0.00	3.44	10.46	0.0	0.00	7.02	0.00	0.00	2.64	9.66
Gomphospaeri	0.00	0.00	0.00	0.00	0.00	7.02	7.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Merimopedia	0.00	0.00	0.00	0.00	0.00	10.30	10.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Microcystis	0.81	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.00	0.25	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nostoc	0.00	0.00	0.00	0.00	1.20	0.00	1.20	0.00	0.00	6.30	0.00	1.55	0.00	7.85	0.00	0.00	6.30	0.00	1.49	0.00	7.79
Oscillatoria	0.98	5.60	8.50	4.07	1.45	9.62	30.22	0.99	3.69	8.50	5.20	0.00	9.62	28	1.00	5.60	8.56	6.01	0.00	9.62	30.79
Spirulina	0.00	0.00	0.00	0.00	0.00	2.78	2.78	0.00	0.00	0.00	0.00	0.00	2.73	2.73	0.00	0.00	0.00	0.00	0.00	2.74	2.74
Total							60.5							58.2							55.95

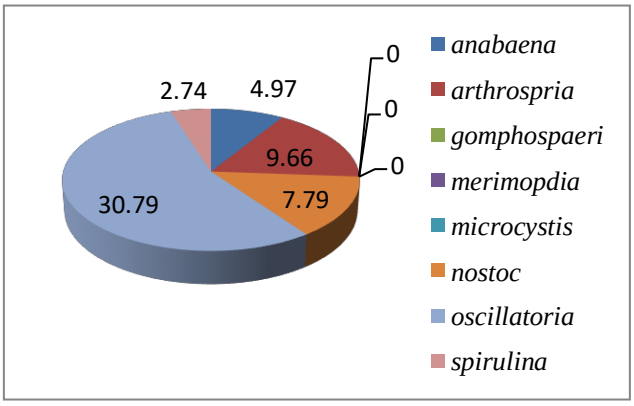
Station I



Station II



Station III



Microcystis sp. are also present and play as primary producers. Diversity of cyanophyceae was highest in station I and lowest diversity shows in station III. *Oscillatoria* and *Arthrospria sp.* are seen to occupy first and second dominant genera.

The result shows the present study that the cyanophyceae diversity of kayamkulam back water showed considerable fluctuation with water quality parameters. Analysis shows some pollution tolarant genera of cyanophyceae like *Oscillatoria*, *Microcystis* hence there is need of regular monitoring of water is essential.

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