

# PHYTOPLANKTON DIVERSITY AND PHYSICO-CHEMICAL ANALYSIS IN BEEDANAHALLI LAKE. MYSURU, KARNATAKA.

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**Abstract:** Phytoplankton are the foundation of aquatic food web. Algae are the good source of food and energy. The physico- chemical parameters and planktonic composition of Beedanahalli lake. In the month of April to July (2022) the total of 63 species plankton species composition was caused by **Bacillariophyceae, Chlorophyceae, Cyanophyceae and Zygnematophyceae, Fragilariophyceae and Euglenoidea.** *Microcystis* is most abundant in this lake. Because of human activities and these were toxic to the humans and they cause algal blooms and it is also dangerous to aquatic animals. So, the care must take to protect the lake from the pollution and conserve the natural habitat of the lake.

**Index terms:** Diversity, phytoplankton, physico- chemical parameters, Beedanahalli lake.

## Introduction:

Phytoplankton represent the very basic of nutritional cycles of an ecosystem. Water is an admiration of nature. Water is necessary requirement forms of life needs protect from the pollution and it cause a threat to human life. Habitat conditions such as salinity, oxygen, temperature and nutrients. Physio chemical parameters effects plankton distribution, occurrence and species diversity. Water supports an ecological balance between numerous groups of living organisms. Phytoplankton responds fast to changes in living environment specific in relation to silica and other nutrients. The stressed systems hold up a remarkable high proportion conditions in living organisms (Srinivas *et al.*, 2018). Lakes are abundantly varying in their physical chemical and biological characteristics, nutrient supply, water quality, climatic variations and human involvement are the major factors determine the tropic status of the lake. Phytoplankton forms the basis of food chain; bio indicators and bio purify of the lake ecosystem. Water, temperature, P<sup>H</sup>, light conditions, nutrient concentrations and predation by phytoplankton in the lake (Kavi *et al.*, 2021). Phytoplankton are microscopic organisms that serves as the key producers in wetlands, especially lakes, due to drifting and widespread alive in water currents. The fresh water plankton is a good bio- indicator for measuring water quality in aquatic systems. The plankton's community composition varies in response to temperature, light intensity, nutrient availability and other factors such as lotic, lentic and coastal areas. The purpose of this to control how the planktonic diversity variation the connection between plankton and surrounding habitat variables, species composition population density and community characteristics depend on different habitat conditions (Ramlee *et al.*, 2022).

## Materials Methodology:

### Study Area:

The present study area **BEEDANAHALLI LAKE** located in Mysore district of Karnataka state, India it is belonging to T. Narasipur taluk. It is located 28 km towards East from district headquarters Mysore. 18 km from Tirumakudalu- Narasipur, 126 km from state capital Bangalore. This lake is also called Bannur Heggere. The lake was about 462 acre and the circumference is 11,000 meters, it stores 0.26 TMC (Thousand million cubic feet) of water. This lake is not suitable for drinking purpose because human activities like washing vehicles, clothes, domestic animals and so many plastic materials. Then the clothes are throwing to the lake and human regular activity is also major reason for the non- drinkable of lake water. Because of anthropological activities, the growth of toxic algae is more in this lake, hence it is not suitable for drinking purpose. (Hulyal *et al.*, 2009).

### Data collection:

Water sample are collected choose site over fifteen days' ones from 15<sup>th</sup> April to July 10<sup>th</sup>. For this study, six sampling points in the lake are choose an approximately around of 0.3 km between each point taking in to human activities such as washing clothes, fishing, bathing, washing domestic animals etc. the exit and inlets morphometric features and growth of aquatic vegetation etc. (Hulyal *et al.*, 2009).



**Figure 1: Collected water samples.**



**Figure 2: View of Beedanahalli lake.**

### Physicochemical analysis of Beedanahalli lake water sample.

The present study carried out analysis of various physico chemical properties of the Beedanahalli lake. Water samples taken in five samplings sites and all are mix together to make integrated sample for testing the chemical parameters and samples are collected in sterilized plastic bottle of 250 ML. the physical parameters are colour, temperature, Odour and chemical parameters are P<sup>H</sup>, Alkalinity, dissolved oxygen, chloride, Carbon dioxide and total hardness of water analysis in laboratory. The physical parameters were measured at the sampling site for better result.

**Table 1: Physicochemical analysis of Beedanahalli lake:**

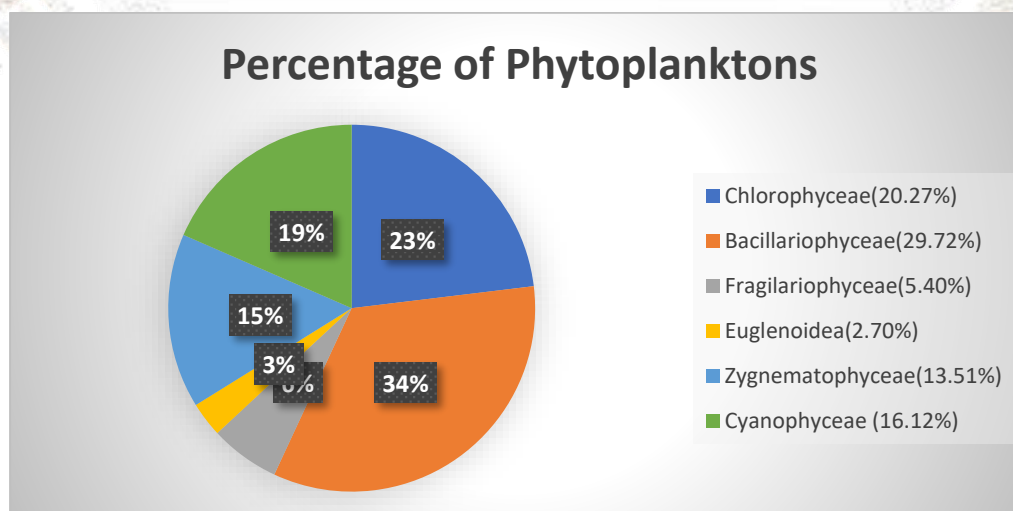
Sl.NO	Parameters	Technique used	Inference
A	Physical parameters		
01	Temperature	Thermometer	23 – 26 <sup>o</sup> C
02	Colour	Visual	No Colour
03	Odour	Physiological sense	Fishy Odour
B	Chemical Parameters		
01	p <sup>H</sup>	p <sup>H</sup> Stripes	10 (alkaline water)
02	Dissolved Oxygen	Redox titration	3.8 Mg/L
03	Total hardness	Complexometric titration	122.8 Mg/L
04	Alkalinity	Acid-base titration	16.2 Mg/L
05	Carbon dioxide	Titration	1.3 Mg/L
06	Chloride	Argentometric titration	14.74 Mg/L

**Result:**

The present study on the diversity of phytoplankton in **Beedanahalli lake** in Mysore district is carried out from the month of April to July and in this time observed **63 species** of phytoplankton belongs to the family *Chlorophyceae*, *Bacillariophyceae*, *Fragilariophyceae*, *Euglenoidea*, *Zygnematophyceae*, *Cyanophyceae*.

**Table 2: Percentage of Phytoplanktons**

Class	No of species	Percentage (%)
Chlorophycean members	15	20.27%
Bacillariophycean members	22	29.72%
Fragilariophycean members	4	5.04%
Euglenoidea members	2	2.70%
Zygnematophycean members	10	13.51%
Cyanophycean members	12	16.12%



**Table 3: List of Phytoplankton's**

SL.NO	Family	Phytoplankton Name	
1	Hydrodictyaceae	<i>Pediastrum</i> Sp.	
2		<i>Pediastrum tetra</i>	
3		<i>Pediastrum duplex</i>	
4		<i>Pediastrum tetras</i>	
5	Oedogoniaceae	<i>Oedogonium</i> Sp.	
6		<i>Oedogonium</i> Sp.	
7	Scenedesmaceae	<i>Scenedesmus acuminatus</i>	
8		<i>Scenedesmus ecornis</i>	
9		<i>Scenedesmus</i> Sp.	
10		<i>Scenedesmus quadricauda</i>	
11		<i>Scenedesmus</i> Sp.	
12		<i>Coelastrum astroideum</i>	
13	Volvocaceae	<i>Pondorina</i> Sp.	
14		<i>Pondorina</i> Sp.	
15		<i>Volvax</i> Sp.	
16	Naviculaceae	<i>Navicula</i> Sp.	
17		<i>Navicula anomoeoneis</i>	
18		<i>Navicula radiosa</i>	
19		<i>Navicula salinarum grunow</i>	
20		<i>Navicula</i> Sp.	
21		<i>Navicula</i> Sp.	
22		<i>Navicula</i> Sp.	
23	Pinnulariaceae	<i>Pinnularia</i> Sp.	
24		<i>Pinnularia</i> Sp.	
25	Cymbellaceae	<i>Cymbella affinis</i>	
26		<i>Cymbella</i> Sp.	
27		<i>Cymbella eunotia veneris</i>	
28	Pleurosigmataceae	<i>Gyrosigma</i> Sp.	
29	Bacillariaceae	<i>Nitzschia</i> Sp.	
30		<i>Nitzschia nana</i>	
31		<i>Nitzschia</i> Sp.	
32		<i>Nitzschia</i> Sp.	
33		<i>Nitzschia</i> Sp.	
34		<i>Nitzschia linearis</i>	
35		Fragilariaceae	<i>Syendra</i> Sp.
36			<i>Syendra ulna</i>

37	Catenulaceae	<i>Amphora diatom</i>
38	Fragilariaceae	<i>Fragilaria Sp.</i>
39		<i>Fragilaria Sp.</i>
40		<i>Fragilaria Sp.</i>
41		<i>Fragilaria Sp.</i>
42	Euglenaceae	<i>Euglena viridis</i>
43		<i>Euglena proxima</i>
44	Desimidiaceae	<i>Staurastrum aculeatum</i>
45		<i>Staurastrum iotantum</i>
46	Zygnemataceae	<i>Spirogyra Sp.</i>
47		<i>Spirogyra Sp.</i>
48		<i>Spirogyra adnata</i>
49		<i>spirogyra Sp.</i>
50		<i>Zygnema C. agardh</i>
51		<i>Pleurotaenium trabecula</i>
52	Closteriaceae	<i>Closterium Sp.</i>
53		<i>Closterium Sp.</i>
54	Oscillatoriaceae	<i>Oscillatoria Obtusa</i>
55		<i>Oscillatoria princeps</i>
56		<i>Oscillatoria Sp.</i>
57	Microcystaceae	<i>Microcystis Sp.</i>
58		<i>Microcystis Sp.</i>
59		<i>Microcystis Sp.</i>
60	Merismopediaceae	<i>Merismopedia elegans</i>
61		<i>Merismopedia tenuissima</i>
62	Nostocaceae	<i>Anabaena Sp</i>
63		<i>Anabaena Sp</i>

### Summary:

The present study is carried out on the diversity of phytoplankton in Beedanahalli Lake in Mysore district, Karnataka, India. The sample was collected from the lake in a plastic well sterilized bottles, the sample was collected between 7 am to 9 am in the month of April to July and then the samples was placed on a sterilized slide covered with cover slip and observed under the microscope. Identify up to species level through standard phytoplankton keys and books.

From the above study found out the 63 species of phytoplankton and identified it up to the species level and the phytoplankton were belonged the class Bacillariophyceae, Zygnematophyceae, Cyanophyceae, Chlorophyceae And the physical parameter like temperature, colour, odour was noted and chemical parameter like P<sup>H</sup>, dissolved oxygen, total hardness, alkalinity, carbon dioxide, chloride was tested through titration

method and the results were noted and observed that the lake water is not suitable for drinking because of the day-by-day human activity and the members of **Cyanophyceae** were also found, these were toxic to the humans and they cause algal blooms and it's also dangerous to aquatic animals. So, the care must take to protect the lake from the pollution and conserve the natural habitat of the lake.

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