

# Phytoplankton diversity from some water bodies of Chandannagar, Hooghly district of West Bengal.

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**Abstract:** From this present investigation total of 45 phytoplankton taxa representing four classes namely Cyanophyceae (7), Chlorophyceae (28), Bacillariophyceae (7), and Euglenophyceae (3) are identified from several water bodies including domestic wastewater and ponds from Hooghly district, West Bengal. *Oocystis pusilla* Hansgirg, *Spirogyra welwitschii* West & G.S. West, *Oscillatoria limosa* C. Agardh ex Gomont, *Cladophora glomerata* (Linnaeus) Kützing, *Anabaena variabilis* Kützing ex Bornet & Flahault are among the abundant from those sites and *Tetraedron granulolum* Playfair, *Kirchneriella obesa* (West) West & G.S. West are found to be rare.

**Keywords:** Biodiversity, Hooghly, Phytoplankton, West Bengal

## 1. Introduction

Phytoplanktons are the major primary producers in the aquatic ecosystems as they formed as base of aquatic food chain (Saravanakumar et al. 2008) and are an important food source for other organisms like zooplanktons, rotifers and fishes etc. They include free floating planktonic forms. These free-floating forms constitute the major flora of any water ecosystem including other benthic and attached algae. Several works have been done by several authors investigating the phytoplankton from water bodies besides firm lands (Mukhopadhyay et al. 1997; Chakraborty et al. 2004; Das et al. 2011, 2015) and from industrial waste (Ghosh & Keshri 2011) from this state.

Hooghly district of West Bengal consists of numerous small to large such waterbodies. Moreover, this district is delimited by the river Hooghly from North 24 Parganas district in the eastern part. Both the river and waterbodies (ponds, lakes etc.) have the enormous impact on the livelihood of the inhabitant of this place including human and all other living beings. Only handful effort has been done on the phytoplankton diversity study from district. Haldar & Sinha (2013a, 2013b, 2015, 2016) carried out few works from this district on mainly green algae. Das et al. (2011, 2015, 2018) worked out similar study in different states of West Bengal.

## 2. Material and Methods

### 2.1 Study Area

All the samples were collected from small water bodies of the Chandannagar town. The period of collection of the phytoplankton specimens were periodically during September 2023 to June 2024. Temperature, pH of water and brief ecological notes were taken during the field study. Samples were preserved in 5% formalin in polythene bags. Observations were made under Olympus GB microscope using GWF as mounting medium. Lugol's iodine solution was also used to preserve the samples. Detailed ecological notes on the samples collected from 6 different study sites are given in the Table 1.

## 3. Result and Discussions

The species wise diversity and availability from different study sites represented in the Table 2. Relative abundance of the total phytoplankton species available from the study sites are also shown here. Total 45 phytoplankton species were found and identified by several monographs (Turner 1892; Hustedt 1930; Desikachary 1959; Prescott 1962; Philipose 1967; Das & Keshri 2016). Among them class Chlorophyceae represented by maximum number of 28 genera, Cyanophyceae by 7 genera, Euglenophyceae about 3 genera and Bacillariophyceae 7 genera.

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From the Table 1, average water temperature was found between 27-31°C from different sites. Shallow wet lands exhibit higher water temperature than the water body like big ponds. The water pH was 7.5-7.9 i.e. neutral to very slightly basic throughout the area. The area was nearly bare land without any big trees nearby but aquatic weeds, grasses etc. growing comparatively low lands.

**Table 1.** Details of the study sites including altitude from sea level, co-ordinates, water pH, water temperatures and short ecological notes.

Study sites	Co-ordinates	pH	Temp (°C)	Habitat
Site 1	22°52'23.9"N 88°21'32.1"E	7.5	31	Brown powder mass with thin filamentous mass on the soil and on the surface of aquatic weeds under water.
Site 2	22°52'11.3"N 88°21'19.0"E	7.5	28	Whitish filament on the surface of aquatic stem under water and phytoplankton samples from water
Site 3	22°51'48.3"N 88°20'47.5"E	7.5	30	Powdery mass and filaments along with semi aquatic weeds from a shallow waterbody.
Site 4	22°51'57.6"N 88°20'17.6"E	7.9	28	Green filaments in the surface of the wet soil
Site 5	22°52'04.6"N 88°20'37.0"E	7.9	28	Small water body with dark green patches with aquatic weeds.
Site 6	22°52'05.9"N 88°20'56.2"E	7.9	27	Small water body with dark green patches with aquatic weeds.

**Table-2:** A complete list of phytoplankton availability from different sites (in 0.02ml)

Sl No.	Name of the phytoplankton species	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6
1.	<i>Achnanthes brevipes</i>	3	-	7	5	-	7
2.	<i>Anabaena circinalis</i>	-	-	-	36	-	34
3.	<i>Anabaena variabilis</i>	41	12	-	32	-	-
4.	<i>Ankistrodesmus falcatus</i>	-	-	-	28	-	15
5.	<i>Bulbochaete satigera</i>	-	-	-	-	-	32
6.	<i>Chara braunii</i>	5	-	-	-	5	-
7.	<i>Chlorella vulgaris</i>	-	43	33	-	-	-
8.	<i>Chroococcus limneticus</i>	-	3	-	5	-	1
9.	<i>Chlorococcum humicola</i>	4	12	-	-	12	-
10.	<i>Cladophora glomerata</i>	55	-	27	30	-	-
11.	<i>Closterium parvulum</i>	-	3	-	1	-	3
12.	<i>Coelastrum microporum</i>	40	-	-	-	-	-
13.	<i>Coleochaete islamii</i>	-	-	22	-	-	-
14.	<i>Crucigenia quadreta</i>	23	-	-	-	-	44
15.	<i>Cymbella acuta</i>	-	-	5	6	-	-
16.	<i>Euglena acus</i>	-	5	-	4	-	1
17.	<i>Eucapsis minuta</i>	15	-	-	17	28	-
18.	<i>Eunotia pectinalis</i>	-	12	-	-	-	-
19.	<i>Gomphonema berggrenii</i>	-	17	-	-	-	-
20.	<i>Gyrosigma fascicola</i>	-	9	1	-	-	-
21.	<i>Hydrodictyon indicum</i>	43	-	-	-	-	32
22.	<i>Hyalotheca dissiliens</i>	-	-	18	-	-	66
23.	<i>Kirchneriella obesa</i>	8	-	-	-	-	-
24.	<i>Navicula gastrum</i>	4	-	-	12	9	-
25.	<i>Nitella mucronata</i>	-	2	-	-	-	-
26.	<i>Nitzschia sigma</i>	-	-	-	3	11	-
27.	<i>Oedogonium fragile</i>	-	7	-	-	-	22
28.	<i>Oocystis crassa</i>	-	-	-	8	-	64
29.	<i>Oocystis elliptica</i>	4	8	-	16	16	-
30.	<i>Oocystis pusilla</i>	-	-	-	16	32	-
31.	<i>Oscillatoria limosa</i>	53	-	-	-	-	-
32.	<i>Oscillatoria sancta</i>	67	-	52	43	-	-
33.	<i>Pediastrum duplex</i>	-	-	-	-	11	-
34.	<i>Pediastrum tetras</i>	-	4	-	4	-	-
35.	<i>Phacus acuminatus</i>	-	-	-	7	-	-
36.	<i>Pleurocapsa minor</i>	33	-	-	-	-	-

37	<i>Pleurotaenium trabecula</i>	-	2	-	-	-	-
38	<i>Rhizoclonium lapponicum</i>	-	-	-	18	35	-
39	<i>Scenedesmus bijugatus</i>	-	12	-	-	-	-
40	<i>Scenedesmus obliquus</i>	-	16	-	-	-	-
41	<i>Scenedesmus spinulatus</i>	-	-	8	12	-	-
42	<i>Scytonema capitatum</i>	35	-	67	-	-	43
43	<i>Spirogyra welwitschii</i>	17	-	-	25	-	-
44	<i>Stigonema mammilosum</i>	-	-	-	-	-	54
45	<i>Tetraedron trigonum</i>	-	-	-	2	-	-

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