

# Assessment on Phytoplankton Diversity from English Bazaar Block of Malda District

Prasanta Kumar Garai<sup>1</sup>, Prashanta Kumar Mitra<sup>2</sup> and Dr. Sudipta Kumar Sil<sup>3</sup>

<sup>1</sup>University Of Gour Banga

<sup>2</sup>University Of Burdwan

<sup>3</sup>University Of Gour Banga

E-mail: <sup>1</sup>prasantagarai11@gmail.com, <sup>2</sup>pkmitrabot@gmail.com, <sup>3</sup>sudiptakrsil@gmail.com

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**Abstract**—This paper represents the diversity report and frequency of different genus relative to sampling locations from English Bazaar Block, Malda District, West Bengal. We have randomly sampled 100 locations throughout English Bazaar Block during July 2017. We have recorded 69 genera belonging to 36 families. Among them *Botryococcus*, *Chlorococcum*, *Diadsmis*, *Aphanocapsa*, *Oscillatoria* shows very high frequency whereas *Chamaecalyx*, *Staurastrum*, *Stauridium*, *Gomphosphaeria*, *Anabaenopsis*, *Actinastrum* shows very low frequency.

## 1. INTRODUCTION

English Bazaar Block (Map 1) is situated in Malda District, West Bengal and located between 24°48' 30" and 25°04' 40" north latitudes and 87°56' 30" and 88°07' 30" east longitudes. Climate is warm and temperate in Malda.

There are very few reports from Malda district regarding phytoplankton diversity. Our prime intention for this investigation is to assess the phytoplankton diversity in this area.

We have sampled randomly throughout English Bazaar for unbiased survey. Samples were collected from wetlands, jheels, ponds, Small stagnant water bodies etc.

Frequency (Table 2, Plot 2) and species accumulation curve (Plot 1) was analyzed.

## 2. MATERIALS AND METHODS

### 2.1. Sample Collection

Samples were collected during July 2017, from 100 randomly chosen sampling sites, throughout English Bazaar. Sample were collected in acid washed glass container and preserved in 4 % formalin.

### 2.2. Identification

Identification was done with the help of Desikachary, Prescott, key's of N. Anand and standard literatures.

### 2.3. Statistical Analysis and Plots

MS Excel was used to record the data, data analysis and plot making was done using PAST 3.



Map 1: Showing the location of english bazar block

### 3. OBSERVATION

#### 3.1 Observed Taxa

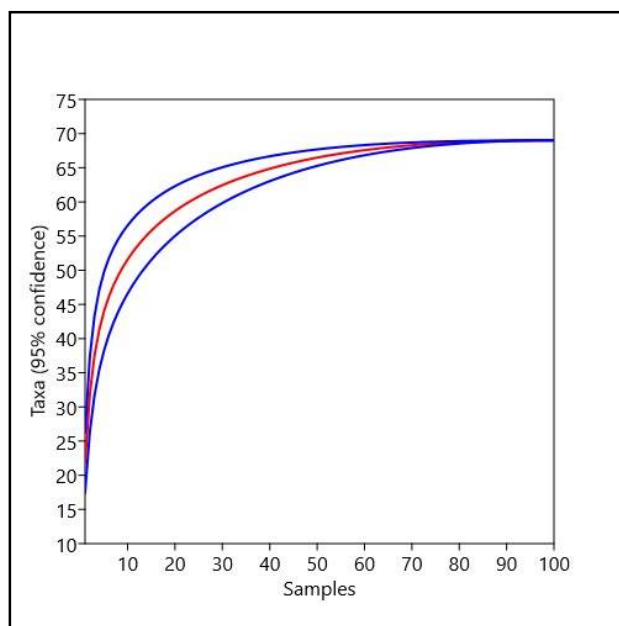
Recorded taxa is represented in the following table.

**Table 1: Recorded taxa from english bazaar block**

List of Taxa					
Sl. No.	Family	Genus	Species		
1	Bacillariaceae	Nitzschia	frustulum		
			holsatica		
			nana		
			palea		
			umbonata		
			sigmoidea		
		Grunowia	tabellaria		
2	Botryococcaceae	Botryococcus	protuberans		
3	Catenulaceae	Amphora	angusta		
4	Chaetophoraceae	Stigeoclonium	attenuatum		
			subuligerum		
		Leptosira	mediciana		
5	Chamaesiphonaceae	Chamaesiphon	confervicola		
		Chamaecalyx	calyculatus		
6	Characiaceae	Characium	angustum		
7	Chlamydomonadaceae	Chlamydomonas	polypyrenoideum		
8	Chlorellaceae	Chlorella	vulgaris		
9	Chlorococcaceae	Chlorococcum	minutum		
10	Cladophoraceae	Cladophora	glomerata		
11	Coleochaetaceae	Coleochaete	scutata		
12	Desmidiaceae	Closterium	calosporum		
			ehrenbergii		
			jeneri		
			kuetzingii		
			moniliferum		
			lunula		
			bitrapezoideum		
			formosulum		
			venus		
				Staurastrum	brebissonii
			thangaicum		
13	Diadesmidaceae	Diadesmis	confervacea		
14	Euglenaceae	Euglena	acus		
			cantabrica		
			proxima		
			splendens		
			viridis		
			anabaena		
			clavata		
				Phacus	acuminatus
					caudatus
					circulatus
			longicauda		
15	Fragilariaceae	Fragilaria	crotonensis		
			incisa		
		Synedra	gracilis		
			tergestina		
		Diatoma	mesodon		
			tenuis		
16	Gomphonemataceae	Gomphonema	angustatum		

			constrictum
			dichotomum
			elegans
			grunowii
			montanum
			olivaceum
			parvulum
17	Hydrodictyceae	Pediastrum	boryanum
			duplex
			tetras
		Stauridium	tetras
		Monactinus	simplex
18	Melosiraceae	Melosira	varians
19	Merismopediaceae	Aphanocapsa	elachista
			grevillei
			incerta
			parasitica
		Merismopedia	glauc
		Gomphosphaeria	aponina
		Microcystis	aeruginosa
			flos-aquae
			novacekii
20	Microchaetaceae	Microchaete	sp.
21	Naviculaceae	Navicula	cyprinus
			didyma
			gottlandica
			lamii
			microspora
			protracta
			striolata
			tripunctata
			viridula
22	Neidiaceae	Neidium	affine
			binode
			gracile
23	Nostocaceae	Cylindropermopsis	raciborskii
		Anabaenopsis	circularis
		Anabaena	oscillarioides
			subcylindrica
24	Oedogoniaceae	Oedogonium	crispum
			globosum
			mitratum
			platygenum
			varians
25	Oscillatoriaceae	Oscillatoria	anguina
			leonardii
			princeps
			subbrevis
			yamadae
		Lyngbya	latissima
		Homoeothrix	varians
26	Phormidiaceae	Arthrospira	khannae
		Planktothrix	compressa
			cryptovaginata
			isothrix
		Tychonema	rhodonema
		Phormidesmis	molle
		Phormidium	acutum
			autumnale

			Chlorinum formosum		
27	Pseudanabaenaceae	Pseudanabaena	biceps galeata		
		Spirulina	major		
		Planktolyngbya	brevicellularis circumcreta contorta		
		Leptolyngbya	lurida		
28	Rhoicospheniaceae	Rhoicosphenia	abreviata		
29	Rivulariaceae	Dichothrix	ledereri		
		Calothrix	geitonos parietina		
30	Scenedesmaceae	Coelastrum	astroideum microporum pseudomicroporum		
			Hariotina	reticulatum	
			Actinastrum	hantzschii	
		Desmodesmus	armatus bicaudatus intermedius		
			Scenedesmus	acutus muzzanensis	
				Acutodesmus	acuminatus obliquus
		Pectinodesmus	pectinatus		
		Dicloster	acutus		
		31	Scytonemataceae	Scytonema	ocellatum
		32	Stauroneidaceae	Stauroneis	anceps pusilla
33	Tabellariaceae	Tabellaria	fenestrata		
		Tabularia	gaillonii		
34	Ulotrichaceae	Ulothrix	gigas tenuissima		
35	Volvocaceae	Pandorina	morum		
36	Zygnemataceae	Spirogyra	acanthophora flavescens kundaensis oblata parvula subsalsa		
			Zygnema	carinatum	



**Plot 1: Species accumulation curve**

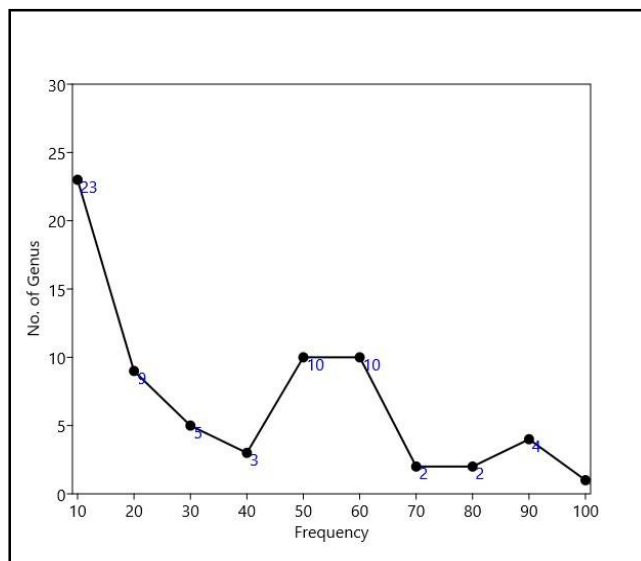
### 3.2. Genus Frequency and Relative Frequency

Frequency and relative frequency of recorded 69 genera from 100 samples is given below.

**Table 2: Frequency and relative frequency**

Sl. No.	Genus	Frequency	Relative frequency
1	Nitzschia	76	3.47
2	Grunowia	32	1.46
3	Botryococcus	90	4.11
4	Amphora	54	2.47
5	Stigeoclonium	7	0.32
6	Leptosira	26	1.19
7	Chamaesiphon	22	1.00
8	Chamaecalyx	2	0.09
9	Characium	38	1.74
10	Chlamydomonas	10	0.46
11	Chlorella	42	1.92
12	Chlorococcum	86	3.93
13	Cladophora	5	0.23
14	Coleochaete	8	0.37
15	Closterium	24	1.10
16	Staurastrum	2	0.09
17	Diadesmis	89	4.06
18	Euglena	11	0.50
19	Phacus	4	0.18
20	Fragilaria	59	2.69
21	Synedra	42	1.92
22	Diatoma	65	2.97
23	Gomphonema	49	2.24
24	Pediastrum	3	0.14
25	Stauridium	2	0.09
26	Monactinus	4	0.18
27	Melosira	4	0.18
28	Aphanocapsa	91	4.16

29	Merismopedia	7	0.32
30	Gomphosphaeria	2	0.09
31	Microcystis	54	2.47
32	Navicula	61	2.79
33	Neidium	49	2.24
34	Cylindrospermopsis	14	0.64
35	Anabaenopsis	2	0.09
36	Anabaena	3	0.14
37	Oedogonium	78	3.56
38	Oscillatoria	88	4.02
39	Lyngbya	40	1.83
40	Homoeothrix	4	0.18
41	Arthrospira	12	0.55
42	Planktothrix	51	2.33
43	Tychonema	45	2.05
44	Phormidesmis	20	0.91
45	Phormidium	46	2.10
46	Pseudanabaena	57	2.60
47	Spirulina	27	1.23
48	Planktolyngbya	14	0.64
49	Leptolyngbya	3	0.14
50	Rhoicosphenia	51	2.33
51	Dichothrix	3	0.14
52	Calothrix	12	0.55
53	Coelastrum	9	0.41
54	Hariotina	3	0.14
55	Actinastrum	2	0.09
56	Tetrademus	49	2.24
57	Desmodesmus	57	2.60
58	Scenedesmus	52	2.37
59	Acutodesmus	57	2.60
60	Pectinodesmus	11	0.50
61	Dicloster	3	0.14
62	Scytonema	5	0.23
63	Stauroneis	44	2.01
64	Tabellaria	50	2.28
65	Tabularia	15	0.68
66	Ulothrix	24	1.10
67	Pandorina	12	0.55
68	Spirogyra	60	2.74
69	Zygnema	47	2.15



Plot 2. Frequency vs Number of genus

#### 4. DISCUSSION AND CONCLUSION

Total 151 species from 69 genera belonging to 36 families were recorded from English Bazaar. *Botryococcus*, *Chlorococcum*, *Diademsis*, *Aphanocapsa*, *Oscillatoria* found to have very high frequency whereas *Chamaecalyx*, *Staurastrum*, *Stauridium*, *Gomphosphaeria*, *Anabaenopsis*, *Actinastrum* shows very low frequency throughout English Bazaar.

Species accumulation curve (plot 1) shows very low increment in taxa after about 50 sample analysis.

Among 69 genera, 23 found to have 1-10% of frequency, 20 genera found to have 41- 70% and 2 genera is found to have 90-100% frequency (Plot 2).

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