



# **SEASONAL VARIATION OF PHYTOPLANKTON IN THE COASTAL WATERS OF CHATTOGRAM**

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Session: 2020-2021

**A thesis submitted in the partial fulfillment of the requirements for the degree of  
Master of Science in Marine Bioresource Science**

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**Chattogram 4225, Bangladesh**

**AUGUST 2022**

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Md. Shafiul Alam Anik

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**This is to certify that we have examined the above Master's thesis and have found that is complete and satisfactory in all respects, and that all revisions required by the thesis examination committee have been made**



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*Dedicated*  
*To*  
*My Beloved Parents*

## ACKNOWLEDGMENTS

I am indebted to Almighty who enabled with courage, strength and patience to complete the research work and write up the dissertation successfully within due time of course.

I would like to express my gratitude and indebtedness to **Prof. Dr. Mohammed Nurul Absar Khan**, Dean, Faculty of Fisheries, CVASU and **Dr. Mohammad Sadequr Rahman Khan**, Associate Professor and Head, Department of Marine Bioresource Science, Faculty of Fisheries, CVASU from the bottom of my heart for their immense administrative support to complete my research work.

I would like to convey my sincere thanks and gratitude to my supervisor **Mr. Avijit Talukder**, and co-supervisor **Nayeema Ferdousy Hoque**, Assistant Professor, Department of Marine Bioresource Science, Faculty of Fisheries, CVASU for their valuable support, advice, supervision and continuous guidance. It was really a great pleasure and amazing experience for me to work under their supervision.

My sincere thanks also go to **Ariful Islam Milon**, **Zannatul Nayma Shareen** for their co-operation during sample collection and examination in the laboratory which made my work easier. I am also acknowledging the Lab assistant, and supporting staffs of Oceanography lab, Faculty of Fisheries, CVASU for their help during sample examination in the laboratory.

Last but not least, I express my deepest sense of gratitude to my beloved parents for their immense sacrifice, blessings and encouragement.

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**AUGUST 2022**

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## List of Abbreviations

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Words	Abbreviation
NO <sub>2</sub>	Nitrite
PO <sub>4</sub>	Phosphate
SiO <sub>3</sub>	Silicate
mL	Milliliter
%	Percent
Km	Kilometer
Mg	Milligram
M	Meter
Psu	Practical salinity unit
mg/L	Milligram per liter
g/L.	Gram per liter
°C	Degree Celsius
µg/L	Microngram Per liter
mS/cm	Milisiemens Per Centimer
e.g	Example
et al	And his associates
etc	Et cetera
Ppm	Parts Per million
St	Station
Cm	Centimeter
TDS	Total Dissolved Solids
TSS	Total suspended Solids
Sig.	Significance
MS	Master of Science
<	Less than
>	Greater than

## ABSTRACT

Phytoplankton has profound influence in ocean biogeochemical processes and contributes in ocean productivity. Bio-diversity, fisheries, and food production are directly impacted by ocean and coastal production, in the fight against climate change. Phytoplankton abundance, availability and its distribution are concerned to this study along the northeastern Bay of Bengal (BoB). Standard techniques were used to measure the fluctuations in coastal productivity (Chlorophyll-a), dissolved nutrients and other physico-chemical parameters. To initiate the study, two coastal areas were selected as Cox's Bazar and Kutubdia, each having two sampling stations. The sampling were done following seasonal pattern of BoB as pre-monsoon, monsoon, post-monsoon and winter during the hydrological cycle 2021-22. During the sampling period, three classes of dominating phytoplankton were identified as Bacillariophyceae, Dinophyceae, and Coscinodiscophyceae. Among the three major groups of phytoplankton, total eleven prominent genera were identified. The highest amounts of phytoplankton was recorded in Cox's Bazar (st<sub>1</sub>) as  $3.931 \times 10^3$  Cells/ L while, in Kutubdia (st<sub>3</sub>) the amount reported as  $2.471 \times 10^3$  Cells/L during monsoon period. The Bacillariophyceae taxonomic family was the most common type of phytoplankton found in all samples. The number of phytoplankton was found to be positively correlated by Chlorophyll-a and nutrients availability. Chlorophyll (Chl-a) content was investigated 0.1986-0.741  $\mu\text{g/L}$ , whereas nutrients concentration (nitrite, phosphate, silicate) showed the crucial factors for phytoplankton abundance specified in statistical test. The other physico-chemical parameters also showed statistically significant changes ( $p < 0.05$ ) among the four seasons and stations. Furthermore, these finding may assist policymakers in enhancing management strategies for ensuring water quality and the phytoplankton population as it indicates a wide spectrum of primary productivity which come from coast or sea.

**Keywords:** Seasonal variation, phytoplankton, nutrients, northern BoB, Bangladesh