DETERMINATION OF PHYTOPLANKTON SINKING RATE IN NORTHERN BAY OF BENGAL: COMPARATIVE STUDY OF SEASONAL CARBON ABSORPTION

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Roll No.: 0119/17

Registration No.: 716

Session: 2019-2020

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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April, 2021

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Dedicated

To

My Beloved Parents

And

Elder Brother

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LIST OF ABBREVIATION

SETCOL	Setting Column
DO	Dissolve Oxygen
Sig.	Significance
ppm	Parts Per Million
m/d	Meter per day
mg C/m^-2d-1	Milligram carbon per square meter per day
et al	And his associates
Min-max	Minimum-Maximum
%	Percentage
NS	No Significance difference
SD	Standard Deviation
MS	Master of Science
µg/L	Microgram Per Liter
g/L	Gram per liter
psu	Practical Salinity Unit

ABSTRACTS

Seasonal carbon flux via “Biological pump” associated with phytoplankton sinking rate were measured conducting this research during monsoon((August 2019) and winter (January 2019).It was done in the Northern east part of Bay of Bengal included three stations (Teknaf,Patenga and Bashbaria). Sinking rate was determined by homogeneous sample method SETCOL. Phytoplankton community was dominant by Bacillariophyceae, Dinophyceae and Chlorophyceae and ten dominant species. The average value found in Bashbaria was 2.62 ± 0.28 m/d (monsoon) and 1.89 ± 0.48 m/d (winter), in Patenga was 2.30 ± 0.15 m/d (monsoon) and 2.56 ± 0.57 m/d (winter), in Teknaf was 2.40 ± 0.06 m/d (monsoon) and 2.33 ± 0.09 m/d (winter).No significant correlation were found between phytoplankton sinking rate and most of the environmental parameters. During this study average total c arbon flux was varied from 5.69 ± 0.61 to 3.99 ± 1.02 mg $C/m^{-2}d^{-1}$ in Bashbaria, 9.07 ± 0.61 to 8.24 ± 1.84 mg $C/m^{-2}d^{-1}$ in patenga and 19.20 ± 2.66 to 14.69 ± 1.37 mg $C/m^{-2}d^{-1}$ in Teknaf during monsoon and winter chlorophyll-a and Total carbon showed strong correlation with carbon flux. Two way ANOVA results Showed that variations in Carbon flux and phytoplankton sinking rate among 3 stations and 2 seasons and depth were significant ($p<0.05$) and PCA showed that there was a close correlation among Carbon flux,Chl-a and Total carbon but no correlation with sinking rateThis study provides an understanding the seasonal carbon export in the water column by dominant marine phytoplankton with an association of phytoplankton sinking.Teknaf coast is the prime contributor of daily carbon export from surface to the bottom among three stations and during monsoon this contribution is higher than winter Because of higher phytoplankton abundance than the other two stations.

Keywords: sinking rate, carbon flux, phytoplankton structure, carbon sequestration