IDENTIFICATION OF PLANKTON COMMUNITY AND THEIR INTER-RELATIONSHIP WITH PRIMARY PRODUCTIVITY OF KAPTAI LAKE

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Department of Fisheries Resource Management

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AUTHORIZATION

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June, 2022

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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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List of abbreviations

Short form	Abbreviation
ANOVA	One-way Analysis of Variance
C	Carbon
CVASU	Chattogram Veterinary and Animal Sciences University
g	Gram
GPP	Gross primary productivity
h	Hour
L	Litre
mg	Milligram
NPP	Net primary productivity
SD	Standard Deviation

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Abstract

The present study was carried out in Kaptai Lake from September, 2021 to February, 2022; for a period of six months to identify the plankton community and establish a relationship between plankton abundance and primary productivity of Kaptai Lake. A total of 15 genera of phytoplankton were identified under the classes Chlorophyceae, Cyanophyceae, Dinophyceae and Euglenophyceae from Kaptai Lake; among which Chlorophyceae was the dominant class. Identified phytoplankton genera were *Actinastrum, Cosmarium, Chlamydomonus, Mougeotia, Pandorin, Pediastrum, Spirogyra, Staurastrum, Xanthidium, Zygnema, Anabaena, Aphanothece, Gleocapsa, Ceratium* and *Phacus.* The highest total phytoplankton abundance in Kaptai Lake was recorded to be 32.22×10^3 cells/L in October whereas the lowest value was observed to be 11.21×10^3 cells/L in January. A total of 8 genera of zooplankton were identified under the groups Rotifera, Crustacea, Arthropoda and Protozoa; among which, Rotifera was the dominant group. Identified zooplankton genera were *Brachionus, Euchlanis, Keratella, Polyarthra, Asplanchna*, Nauplius, *Cyclops* and *Paramecium*. The highest total zooplankton abundance in Kaptai Lake was recorded to be 5.06×10^3 cells/L in October whereas the lowest value was observed to be 1.92×10^3 cells/L in January. Mean gross primary productivity of Kaptai Lake throughout the period of study was (359.16 ± 104.51) mgC/m^3/day and net primary produtivity was (209.81 ± 60.87) mgC/m^3/day. Phytoplankton abundance showed a statistically significant, strong positive correlation with zooplankton abundance; as well as a moderate positive correlation with gross primary productivity ($p < 0.05$).

Key words: Kaptai Lake, plankton community, primary productivity, correlation