DYNAMICS OF FISH LARVAL DIVERSITY IN THE COX'S BAZAR COAST, BANGLADESH: SPATIOTEMPORAL DISTRIBUTION AND ENVIRONMENTAL RELATION

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Roll No.: 0122/01

Registration No.: 1115

Session: 2022-2023

A thesis submitted in the partial fulfillment of the requirements for the degree of Master of Science in Fisheries Resource Management

Department of Fisheries Resource Management

Faculty of Fisheries

Chattogram Veterinary and Animal Sciences University

Chattogram-4225, Bangladesh

June 2023

Authorization

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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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The Author

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LIST OF ABBREVIATIONS

ABBREVIATION	FULL FORM
DoF	Department of Fisheries
Kg	Kilogram
g	Gram
mg	Milligram
DO	Dissolved Oxygen
TSS	Total Suspended Solids
TDS	Total Dissolved Solids
mL	Milliliter
mm^3	Millimeter Cube
ppm	Parts per Million
ppt	Parts per Thousand
SPSS	Statistical Package for the Social Sciences
^oC	Degree Celsius
cm	Centimeter
Km	Kilometer
%	Percent
L	Liter

ABSTRACT

Fish larval abundance, diversity, and ecological indices along the southeast coast of Cox's Bazar were assessed at five sampling stations: Moheshkhali Para (S1), Naf River Estuary (S2), Bakkhali River Estuary (S3), Rezukhal Estuary (S4), and St. Martin (S5). Monthly sampling covered three seasons from January to December 2022. Samples were collected with a Bongo net. Water volume was determined with a flow meter and hydrological data (Temperature, pH, alkalinity, and salinity) were collected. Fish larvae were identified morphologically at the family level. The relationship between larval occurrence and environmental factors was investigated through Canonical Correspondence Analysis (CCA). A total of 3,082 larvae under 32 families were found. S2 had the most families (24), while S5 had the fewest (16). Clupeidae, Engraulidae, Gobiidae, Ambassidae, and Sillaginidae were most abundant. S3 had the highest count (40.11 ± 71.08) per 1000 m^3, whereas S1 had the lowest (17.44 ± 22.17). Larval counts were greater in the monsoon and summer than in winter, and number of fish family was highest in the monsoon. S1 had the highest species richness (Margalef's index: 2.26 ± 1.26), diversity (Simpson's Index: 0.83 ± 0.09, Shannon-Weiner Index: 1.95 ± 0.52), and evenness (Pielou's evenness index: 0.84 ± 0.01). In contrast, S5 had the lowest (1.54 ± 0.70, 0.69 ± 0.09, 1.47 ± 0.29, and 0.64 ± 0.15). No significant variation ($p > 0.05$) was found in the indices among stations. Regarding seasons, Simpson's Index and Shannon-Weiner Index (H) exhibited significant variation ($p < 0.05$). Temperature, pH, total alkalinity, and salinity ranged from 22.7-32.9 °C, 6.6-8.5, 78-126 mg/L, and 15.3-37 ppt, respectively. Ambassidae and Mugillidae had positive correlations with alkalinity and pH and Engraulidae with temperature. These findings may enhance the understanding of coastal and marine fish larval research in Bangladesh.

Keywords: Fish larvae, aquatic ecology, estuary, biodiversity, management