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## RESEARCH REPORTS

Sustainable Aquaculture for a Secure Future

**Title:** Study on Environmental Implications and Its Impact on Aquatic Productivity in the Southwest Coastal Region

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**Abstract:** An experiment was conducted on environmental implications and its impact on aquatic productivity in the southwest coastal region for a period of 2 months (May-June/2013). Five Rivers such as Pira River, Andarmanik River, Sonatala River, Khaprabhanga River and Rupsaha River were selected for sample collection and were treated as T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub>. Three sampling sites were selected from each River based on salinity. The overall mean values of water temperature were 28.17 ± 0.98, 27.41 ± 1.21, 28.12 ± 1.11 and 27.13 ± 1.26, 26.62 ± 1.01 °C in treatment T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub>, respectively. The mean values of water transparency of treatments T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub> were 36.00 ± 1.26, 31.0 ± 0.0894, 34.00 ± 1.94, 28.00 ± 1.46 and 31.00 ± 1.86 cm, respectively. The overall mean values of water temperature were 6.56 ± 0.12, 6.47 ± 0.23, 6.34 ± 0.12, 6.19 ± 0.22, and 6.67 ± 0.29 ppm in treatment T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub> respectively. pH values were found to fluctuate from 6.72 to 7.64, 6.48 to 7.13, 6.95 to 7.35 and 6.86 to 7.6 in treatment T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub> respectively. Mean values of total salinity were 2.17 ± 0.12, 6.17 ± 0.82, 7.17 ± 0.92, 10.17 ± 0.1.12 and 1.78 ± 0.12 mg/l in treatment T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub> respectively. Mean values of total alkalinity were 187.5 ± 2.25, 165.5 ± 3.1, 185.5 ± 2.15, 175 ± 2.5 and 180.5 ± 3 mg/l in treatment T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub> respectively. Mean values of total alkalinity were 187.5 ± 2.25, 165.5 ± 3.1, 185.5 ± 2.15, 175 ± 2.5 and 180.5 ± 3 mg/l in treatment T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub> respectively. Mean values of total alkalinity were 187.5 ± 2.25, 165.5 ± 3.1, 185.5 ± 2.15, 175 ± 2.5 and 180.5 ± 3 mg/l in

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treatment T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub> respectively. Total hardness of water was found to range from 37 mg/l to 199 mg/l. The mean values of NH<sub>3</sub>-N (mg l<sup>-1</sup>) were found to vary from 0.23 ± 0.03, 0.27 ± 0.08, 0.23 ± 0.03, 0.25 ± 0.03 and 0.27 ± 0.05 mg l<sup>-1</sup> in treatment T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub> respectively. The mean values of nitrite (NO<sub>2</sub>) concentration were 0.63 ± 0.06, 0.68 ± 0.08, 0.67 ± 0.09, 0.73 ± 0.03 and 0.67 ± 0.06 mg l<sup>-1</sup> in treatment T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub> respectively. There were no significant differences of temperature, dissolved oxygen pH and alkalinity among the treatments but significant differences were found in transparency, salinity, hardness, ammonia, nitrite using ANOVA (P < 0.05). Ammonia and nitrite concentration of Rupsha River (T<sub>5</sub>) higher than other four Rivers due to municipal waste product of Khulna city. A proportionally strong relationship was found among salinity, transparency and hardness. Highest concentration of phytoplankton was found in Rupsha River (lowest salinity) and lowest phytoplankton concentration was found in Khaprabhanga River (highest salinity).

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