



Impact of Spirulina Supplementation on the Growth and Physiological Process in Nuna Tengra (*Mystus gulio*)

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**A thesis submitted in the partial fulfillment of the requirements for the degree of
Master of Science in Fish Biology and Biotechnology**

Department of Fish Biology and Biotechnology

Faculty of Fisheries

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JUNE 2024

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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ABSTRACT

Spirulina, a large cyanobacterium, is a potential alternative protein source for fish. This study examines the effects of spirulina on the growth, feed utilization, and physiological processes of *Mystus gulio*, a commercially important marine fish species of the Bay of Bengal, Bangladesh. Juvenile *M. gulio* was supplemented with four different spirulina regimes such as 0%, (control, T1), 3% (T2), 6% (T3), and 9% (T4) per kg diet for seven weeks. Results showed that the experimental group T4, supplemented with 9% spirulina, had significantly higher weight gain, specific growth rate (SGR), relative growth rate (RGR), and feed conversion efficiency (FCE) compared to the control group (T1). A higher percentage of spirulina supplementations (T4 group) also showed a significantly higher hepatosomatic index (HSI) (2.071 ± 0.344) indicating improved liver function. In contrast, the lowest visceral weight (0.236 ± 0.40) and visceral somatic index (VSI) (6.54 ± 0.82) were recorded at T4 which indicates better digestibility of food. Significantly higher levels of RBC, WBC and cholesterol levels was found in spirulina-supplemented fish representing better body physiology, enhanced immunological function and altered lipid metabolism. Spirulina supplementation also had a significant impact on female gonads by increasing the gonadosomatic index (GSI) and gonadal maturity signifying the enhanced reproductive investment and potential improvements in fecundity and spawning outcomes. The findings of the present study highlight Spirulina as a beneficial feed additive for enhancing growth performance in *Mystus gulio*, reducing feed costs, and promoting sustainability in aquaculture.

Keywords: Spirulina, feed, aquaculture, growth, physiology, reproduction, *Mystus gulio*