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

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Department of Fish Biology and Biotechnology

Faculty of Fisheries

Chattogram Veterinary and Animal Sciences University Chattogram-4225, Bangladesh

JUNE 2024

Authorization

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June 2024

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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*