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Role of Zinc Dietary Supplement on Induced Breeding Potential of Freshwater Catfishes

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The fresh water catfish (*Mystus seenghala*), hardy natured fish having high survival rate and production @ 1, 07,500 Kg/ha/yr reported from Thailand by Sidthimunk et al.(1966). Catfish is a highly esteemed table fish in the Inland areas of our country especially in Bihar. Regarding this favorable features investigations on the culture of cat fishes have been taken up at the Motipur Pond, Muzaffarpur, Bihar. As availability of the stocking material is a prerequisite for culture experiments were conducted to breed the species by artificial insemination techniques after supplementing the diet by Zinc. Zinc an inorganic micro mineral, metal ions required in fish (Gatlin et al. 1901). Zinc acts as a hormone receptor modulator. It induces testosterone hormone which improves the quality and quantity of the species (Yungsang et al., 2011; Yamaguchi et al., 2013; Peyaran et al., 2014). The experimental pattern for this work was done by using randomized design with five treatments and five replications. The broods' baths, male and female, were fed with Zn supplementation for 60 days. The different concentrations of Zn, i.e., 0, 40, 80, 120, and 160 mg/kg of feed, were supplemented into the freshwater experimental fish.

Zn supplementation affected the volume, motility, viability, and concentration of the eggs and semen in male freshwater catfish *Mystus seenghala &* fish broodstocks. Based on the volume of eggs and semen, motility, viability, and concentration of sperm, the supplementation treatment at a dose of 160 mg/kg was shown to be the most effective treatment. The study of freshwater fish egg and semen volume was conducted over a 60-day period. The egg and semen volume increased after 30 days for the 120 and 160 mg/kg treatments and after 45 days for the 0, 40, 80, 120 and 160 mg/kg treatments. The results of supplementing with 160 mg/kg of zinc showed a rise of 10.6%, 4.81%, and 53.1% in the parameters of motility (96%), viability (93%), and sperm concentration (37.23×109 cells/mL), respectively.

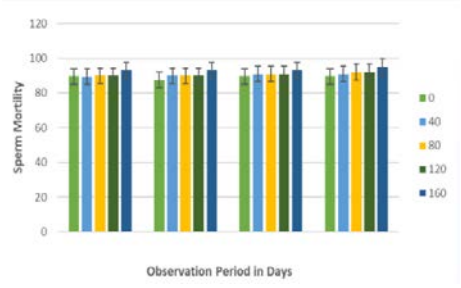

Figure 1. Sperm motility with of Zn feed supplementation for 15 days.

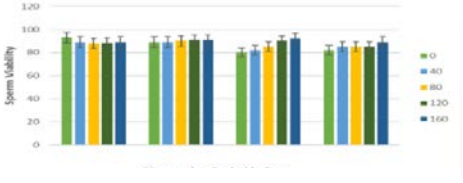

Figure 2. Sperm viability with Zn feed supplementation for 15days.

Zinc is becoming more and more necessary, particularly throughout the growth and reproductive phases (Widhyari et al., 2015). The most noteworthy outcome was the 160 mg/kg zinc supplementation, which increased the semen volume by 50%, the motility by 10.6%, the viability by 4.81%, and the concentration by 53.1% in comparison to the control. However, as the amount of zinc in the feed increases, the sperm volume also increases, which may have an impact on the ovum's and sperm's rates of motility. Sperm motility rates decline, which in turn lowers the rate of fertilization. Thus it is concluded that Zinc play an important role in fish fertilization by enzyme activation, hormone regulation, immune function and in quality improvement of eggs.