

Towards Domestication: Evaluating Rearing Methods for the Conservation of *Betta channoides*

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Abstract

Introduction: The *Betta channoides*, an endangered species of Indonesian endemic freshwater fish, has been successfully acclimatized and reared in aquaculture facility in the city of Depok, West Java, Indonesia, far from its native habitat in East Kalimantan, Indonesia. This study aimed to establish a methodology for its adaptation, rearing and domestication for breeding and restocking purposes. It was hypothesized that darker environments might reduce stress and improve fish performance, whereas increased visibility could either stimulate or stress the fish.

Material and Methods: In this experiment, 100 immature fish (50 males and 50 females) were collected from the wild. After acclimatization, they were used in a rearing experiment involving three different containers: 1) Styrofoam boxes (SB – opaque), 2) plastic containers (PC – semi-transparent), and 3) glass aquaria (GA – transparent). This experiment was conducted in three replicates, with five males and five females housed separately in each. The fish were fed with bloodworms (*Chironomus* sp. larvae) and/or mosquito larvae (*Culex* sp.) ad libitum during the experiment. The 30-day experiment focused on growth based on length and weight, survival rate and blood glucose levels.

Results: Container type had a significant impact on fish length, weight and blood glucose levels, with gender-specific responses ($P < 0.05$). Males grew longest in PC (0.83 ± 0.05 cm) and were heaviest in PC (0.42 ± 0.01 g) and GA (0.42 ± 0.03 g). Females showed the greatest increase in length in SB (0.35 ± 0.04 cm). Survival rates were not significantly affected by container type ($P > 0.05$). Blood glucose levels varied, with the highest levels observed among females in SB (86.75 ± 20.02 mg/dL) and the lowest among males in GA (43.67 ± 8.34 mg/dL).

Conclusion: This research presents that a glass aquarium is the most suitable rearing container for *Betta channoides* that inducing minimal stress, as indicated by the lowest blood glucose levels recorded. Rearing in aquariums was associated with the least stress for the fish, which is especially important during rearing and maintaining spawners for reproduction. This study successfully demonstrated the potential for adapting and breeding the endangered *B. channoides* in captivity.