

Abstract 3:

Genetic parameters for growth and genotype by environment interaction of Nile tilapia in freshwater and brackish water

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The increasing salinity in coastal area is a problem that affects livelihoods of farmers in Indonesia and other parts of the world. Growing aquaculture species outside their preferred salinity range reduces growth performance. A fast growing species is needed with good adaptation to the brackish water ponds. Tilapia is a promising species with fast growth in freshwater that can also be cultivated in brackish water. However, to successfully produce tilapia in brackish water a strain with good growth over a range salinities is needed. To improve these traits, estimation of genetic parameters and genotype by environment interaction (GxE) in brackish water and freshwater is required. Objectives of this study were to investigate: 1) the genetic parameters of tilapia growth traits and 2) the presence of GxE interaction between brackish water and freshwater. For this, 91 fish families were produced following the one male to three females mating design. For each family, 20 fingerlings were randomly chosen and communally reared for grow-out in a brackish water and freshwater pond. After the grow-out period of 120-147 days, fish were harvested and recorded for harvest weight (HW) and standard length (SL). Daily growth coefficient (DGC) and length growth rate (GR) were also calculated based on weight and length data. No significant differences of trait levels were found between brackish water and freshwater. Heritabilities were moderate to high (0.35-0.72) for all trait in both environments. Genetic correlations between brackish water and freshwater for HW, SL, DGC and GR were moderate to high (0.64-0.79). In conclusion, the impact of GxE interaction between brackish water and freshwater is limited. The high value of genetic correlation between brackish water and freshwater showed that growth performance in fresh water is a good indication for growth potential in brackish water, indicating a high level of resilience in this tilapia strain to salinity stress.