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Effect of Genetic Selection for Increased Body Weight at Harvest on Disease Resistance and Immune Responses of Nile Tilapia *Oreochromis niloticus*

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Abstract

The potential effect of selection for growth and related traits of Nile tilapia *Oreochromis niloticus* on disease resistance and a variety of specific and nonspecific immune parameters was investigated between two different lines of *O. niloticus* (selected bred line SBL derived from the 8th generation selected for increased body weight at harvest and a random bred line RBL), via an experimental challenge through the intraperitoneal route with *Aeromonas hydrophila*. Prior to challenge, SBL showed observed enhancement of survival rate and significant increases ($p < 0.05$) of growth performance compared to RBL group after a rearing period of 180 days in circular earthen ponds. Mortalities due to challenge were higher in RBL group than those recorded in SBL group. SBL group revealed significant increases in the hematological indices compared to the RBL group, which were consistently higher in females than males before and after the challenge. Plasma total proteins, albumin, α , β and γ globulins were significantly higher in SBL group, which also showed a significant increased level in plasma glucose in comparison to RBL group, in which plasma cortisol recorded significantly higher levels than in SBL group. Results of the immune responses (leukocyte phagocytic activity, respiratory burst activity, lysozyme activity, and plasma immunoglobulins) showed significant increases in SBL group compared to RBL group. The results of the present study revealed a positive effect of selection for growth of *O. niloticus* on disease resistance and immune responses, which indicate the possibility of indirect selection for disease resistance in breeding programmes in which growth and size are the selected traits in *O. niloticus*.

Keywords: Disease resistance, genetic selection, *Oreochromis niloticus*