# On-farm genetic parameter estimates and response to selection for harvest body weight of *Oreochromis shiranus* in the 5th generation

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Abstract

Genetic parameters and realized response to selection for harvest body weight were obtained for the $F_5$ generation of *O. shiranus* during on-farm growth testing in Chingale, Zomba, Malawi. Two lines of fish, the selected and control were used for the experiment. The selected line was produced through single pair mating of $F_4$ broodstock in 1 x 1 $m^3$ hapas. The broodstock was selected using combined family and within family selection. There were 17 males and 51 females that were mated using a hierarchical design. The full-sib families were reared separately for 90 days before PIT tagging and growth performance testing in 10 common ponds that were owned by 10 fish farmers. The control line was produced through on-farm mass spawning of $F_4$ broodstock whose mean breeding values were around the mean. The realized genetic gain was estimated as the difference in the least squares mean of the selected and control lines expressed as a percentage of the base population least squares mean. The heritability value was 0.30 but was accompanied by a large full-sib family effect of 0.26. The realized genetic gain over the five generations of selection was 37.8% representing 7.6% per generation. The selected lines showed higher (10%) survival from the control lines. The results are discussed in relation to the importance of on-farm genetic selection for small scale farmers and the sustainability of the breeding program.

Key words: *On-farm genetic parameters estimates, realized genetic gain, survival, control and selected lines of tilapia*

Biography



Dr. Alfred Maluwa, holds a PhD in Quantitative genetics from the Norwegian University of Life Sciences in Norway, in 2006. He is currently working at the Malawi University of Science and Technology (MUST) as Director of Research, Postgraduate studies and Outreach since 2016. Dr. Maluwa has vast experience in Research and Development, starting as a Fisheries Research Officer and then as Director of Research at University of Malawi and MUST. He is the Principal Investigator of the Tilapia Breeding Program in Malawi, which through genetic selection work, has improved harvest body weight of a local tilapia species, *Oreochromis shiranus* in Malawi. He is principal investigator of three other projects in science, technology and innovation at MUST. He teaches Biostatistics, Research Methods, Bioethics and Technology commercialization to both undergraduate and postgraduate students at MUST. He is supervising M.Sc. students and co-supervising PhD students in other local and international universities. He is managing national and international cooperation with partner institutions in science, technology and innovation and has published 48 papers and seven book chapters in the science, technology and innovation. His passion is on technology and product commercialization through incubation.