

## 11. STUDY ON OPTIMUM STOCKING DENSITY OF MONO-SEX AND MIXED-SEX CULTURES OF TILAPIA

Mwanguluba, E. I., MSc. (Agric.)(1997)

*Supervisor: Dr. A. N. Katule*

This study was carried out to determine the optimum stocking density of Tilapia (*Oreochromis niloticus*) in mono-sex and mixed-sex cultures. Tilapia at an age of 1 month were tagged and stocked in 7m<sup>3</sup> concrete tanks either separately by sex or as a mixed-sex culture at stocking densities of 2,4 and 8 fish/ m<sup>2</sup>. The growth study was carried for 64 days and data on individual fish length, weight and diameter were recorded in the three growth periods, from which gain in body length and weight, growth rate with respect to length and weight were obtained. Also variables such as specific growth rate and condition factor were calculated. Water quality variables, phytoplankton cell density, cell biomass and species composition were recorded. Other water quality variables considered included water mineral content, temperature and pH. The study revealed significant (P<0.05) differences between sexes for specific growth rate, body weight and length gain and rate of increase in weight during period one (25 days after stocking). However, culturing systems (i.e. male, female and mixed-sex culture) showed no significant differences in all three growth periods. There was never-the-less, a general tendency for males to outperform females in the growth variables. Regarding water quality variables, only electroconductivity and alkalinity showed significant differences between the culturing systems. Variables such as phytoplankton biomass, calcium, electroconductivity and magnesium showed significant differences between stocking densities. These were increasing with stocking density, probably because of higher level of egested and excreted materials. High stocking densities significantly depressed growth variables. There were significant (P<0.05) differences between stocking densities for specific growth rate, weight gain and gain in length during period 1, as well as for specific growth rate, weight gain and growth rate in weight in periods 2 and 3 (42 and 64 days after stocking). At harvest time (123 days after stocking), the higher

stocking density was superior in final biomass, biomass gain and fish yield, whereas the proportion of fish reaching marketable size was higher at lower stocking density than at high stocking densities. Male tilapia significantly outperformed the females with respect to all harvest variables considered except survival rate. It is concluded from the results that there is an advantage to practice male culture at the stocking density of 2 fish/m<sup>2</sup> basing on higher growth variables during growing period and higher proportion of marketable fish at harvest.