EFFECT OF STOCKING DENSITY OF RED HYBRID TILAPIA (*Oreochromis* sp.) ON GROWTH AND SURVIVAL OF TILAPIA AND SHRIMP (*Litopenaeus vannamei*) IN POLYCULTURE

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Abstract

A single earth pond (3/4 hectare) was prepared and divided into nine (7 x 30m) encloses that were considered to be three blocks of three enclosures, during a water exchange the water past first for block A (first use water), then block B (second use) and finally block C (third use). Each block was randomly stocked with shrimp (*Litopenaeus vannamei*) and three different densities of red tilapia hybrids (with an *Oreochromis mossambicus* genetic component) to give three different treatments: T1: zero tilapia per m^2 and 30 shrimp m^2; T2: 0.25 tilapia per m^2 and 30 shrimp m^2; T3: 0.50 tilapia per m^2 and 30 shrimp m^2. Growth of the tilapia and shrimp in each enclosure were sampled approximately every two weeks.

During the 2 month experiment, temperature ranged from 16.2 to 25.6 °C and salinity from 28 to 35ppt. Growth rates of the tilapia and shrimp across the different treatments were similar and no significant differences were observed in mean sample weights for any sample date. Growth of the tilapia was also similar across the experimental blocks and no significant differences were observed. The tilapia grew from 4.6±0.9g to mean final weights from the replicates that ranged from 32.8±8.1g to 38.8±10.0g. However, the experimental blocks had a significant ($P<0.05$) affect on mean sample weight of shrimp and when the experiment finished shrimp in blocks B and C were significantly ($P<0.05$) bigger than shrimp from block A. The shrimp grew from 0.004g to mean weights from the replicates that ranged from 1.82±0.40g to 2.07±0.45g in block A and from 2.08±0.48g to 2.29±0.47g in blocks B and C. There was no significant difference in survival of tilapia among the different treatments and blocks, survivals ranged from 86 to 92%. A larger variation was observed in the survival of the shrimp, the replicates exhibited a range from 46.6 to 73.9%. The survival from block A that ranged from 66.4 to 73.9% were significantly ($P<0.05$) higher than in blocks B and C that exhibited survivals that ranged from 46.6 to 57.0%.

The three stocking densities of tilapia (0, 0.25 and 0.50 tilapia per m^2) did not affect survival or growth of the tilapia or shrimp. Shrimp survival and growth was affected by position of the enclosure in the pond, survival and growth was significantly higher with water that had previously passed through other enclosures.