

## **Effects of aquatic plants on nutrient concentration in water and growth performance of fantail goldfish in an aquaculture system**

### **ABSTRACT**

The effects of two aquatic plants, duckweed (*Lemna* sp.) and azolla (*Azolla* sp.), on the growth performance of fantail goldfish (*Carassius auratus*) and dissolved nutrient concentrations were studied. The experiments were carried out in triplicate sets over a period of seven weeks. Eight specimens of fantail goldfish (length =  $5.16 \pm 0.06$  cm; body weight =  $2.30 \pm 0.06$  g) were released into each of the aquariums containing 40 L of water. Submerged sponge filters were used as the substrate (bed) for the nitrifying bacteria to facilitate nitrification. The fish were provided feed at the rate of 2% of their body weight twice daily. In situ and ex situ water parameters (temperature, dissolved oxygen, pH, total suspended solids, ammonia, nitrite, nitrate, and phosphate), body weight and length of the Fantail goldfish, and wet weight of aquatic plants were measured weekly. The results showed no significant differences ( $p > 0.05$ ) in any of the three aquariums in water temperature, pH, and dissolved oxygen. Survival of the fish was 100%. The highest food conversion ratio and specific growth rate were observed in the aquarium stocked with duckweed, followed by the aquarium with azolla and the control set ( $p < 0.05$ ). The concentrations of nutrients (ammonia and nitrate) were recorded lowest ( $p < 0.05$ ) in the aquarium with azolla, followed by duckweed and the control. The results suggested that aquatic plants were effective in absorbing nutrients and can serve as biofilters to create better conditions for the growth of the fantail goldfish.