Effect of stocking density on water quality, growth and survival of goldfish (*Carassius auratus*) post-larvae under an Intensive feeding system

A G L A Sumith Kumara[1], U Edirisinghe*[1] and C M B Dematawewa[1]

[1]Department of Animal Science, Faculty of Agriculture, University of Peradeniya, Peradeniya.

Determination of optimum stocking density for intensive goldfish rearing systems is vital for profit maximization. This experiment was conducted to determine the effect of stocking density (**SD**) on water quality, growth and survival of goldfish (*Carassius auratus*) post-larvae. Day-old post-larvae (**PL**) were introduced to glass aquaria (0.06 $m^{2)}$ at five different stocking densities (350, 500, 650, 800 and 950 PL/$m^{2)}$ using 3 aquaria per density level. PL were fed with *Artemia* nauplii, three times per day *ad libitum* throughout the post-larval period (21 days). Water quality parameters (NH_3 concentration, pH, temperature and conductivity) were measured at four-day intervals. Live weight (**LW**) and total length (**TL**) were measured from random samples of PL from each replicate on Day-6, 11, 16 and 21. Specific growth rate (**SGR**) was measured as a percentage of logarithmic difference between final and initial weights per unit time. Dead PL were recorded and replaced by fresh PL of same age to maintain the required SD level. One-way ANOVA procedure was used to determine the effect of SD on each parameter and the means were compared using Duncan's Test (DNMRT). NH_3 and conductivity levels increased significantly with increase in SD ($P<0.05$). However, all water quality parameters remained within the acceptable ranges for all SD levels. LW, TL, Growth rate (g/day) and SGR (%/day) significantly decreased with increase in SD ($p<0.05$) since Day-16. At the end of the experiment, all growth parameters were at the highest ($P<0.05$) both at 350 and 500 PL/m^2. Survival rates remained above 80 per cent and were not significantly different among treatments ($P>0.05$). Thus the optimum SD that would maximize growth performance of goldfish PL per tank under intensive system is 500 PL/m^2.

Financial assistance from CARP (Research Grant No. 12/391/289) and Aquatic Resources Development Project is acknowledged.

* Tel: