Integration of Ornamental Fish with Paddy: Performance of Goldfish (*Carassius auratus*) Post-Larvae and Fry in Lowland Paddy Cultivation

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Experiments were conducted in 2003 and 2004 to investigate the performance of goldfish (*Carassius auratus* L. 1758) post larvae (PL) and fry in irrigated paddy cultivation with improved protective measures. In the first experiment goldfish PL were stocked at 120 PL/m^2 in the pond refuge of 1 m^2 in two seasons in four paddy plots and in the second experiment goldfish fry were stocked at 80 fry/m^2 in two other seasons in four plots. Indoor tanks stocked at 120 PL /m^2 and 80 fry/m^2 were taken as the control. Total length (TL), standard length (SL), body depth and weight of fish were measured biweekly up to eight weeks of stocking. Condition factor (CF) and survival rate were calculated and the fish were ranked according to morphological merits.

PL stocked in paddy plots had reached a live weight of 2.20g ± 0.86, CF of 0.68 ± 0.22, TL of 4.5 cm ± 0.85 and SL of 3.2 cm ± 0.33 which were significantly different ($p<0.05$) from the control. The survival rate (15%) was low compared to that in control (27%). A significant difference ($p<0.05$) in the TL, SL and weight of fry in the control and paddy plots were observed from the fourth week of stocking. At harvesting TL and SL of fry were 3.4 cm ± 0.28 and 2.9 ± 0.26 in the control and 7.5 cm ± 0.69 and 5.6 cm ± 0.46 in paddy plots, respectively. Fish produced in paddy plots and in the control were within the marketable size. Live weight of fish in the control and in paddy plots were 0.69 g ± 0.20 and 9.54 g ± 2.88, respectively. Growth of fish fry in the control and in paddy plots was significantly different after the fourth week of stocking. Percentage of fish that developed red metallic, orange and yellow metallic body colours were 78%, 20% and 5% in paddy plots, while it was 43%, 44% and 13% in fry stocked in the control, respectively. The survival rates of fish fry observed in the control was 74% and in paddy plots was 54%. Paddy yield of the plots with protective cover (4054 kg/ha ± 113) was significantly different from yield of other plots which was 3287 ± 126 kg/ha. Results of this experiment indicate that there is a potential for the production of marketable size goldfish 7600/ha at the present stocking rate in eight weeks culture cycle starting with PL or fry integrated in paddy with a complete net cover over the plots as protective measures.

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