

Short Communication

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Comparative Studies on Growth and Survival of the Larvae of Hybrids of Two Clariid Catfish *Clarias macrocephalus* (Gunther) x *Clarias batrachus* (Linnaeus)

M.S. ALAM, M. F. A. MOLLAH AND M. R. I. SARDER

Department of Fisheries Biology and Limnology,
Bangladesh Agricultural University, Mymensingh 2202,
Bangladesh

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Among the 14 *Clarias* species of Asia [1], *Clarias batrachus* (Linnaeus) is the lone species found in Bangladesh. *Clarias macrocephalus* (Gunther), has recently been introduced in this country.

Hybridization is a process of interbreed between different races, species, genera or varieties. The potential production of hybridization include heterosis, introgression, establishment of base populations for selection, combination of specific traits, and production of sterile and monosex hybrids [2].

Tarnachalanukit [3] produced hybrids between *C. macrocephalus*, *C. batrachus* and *Pangasius sutchi* and studied fertility, hatchability and post yolk absorption survival rates. Our objectives were to compare the growth and survival rates of the hybrids between female *C. macrocephalus* x male *C. batrachus* and between female *C. batrachus* x male *C. macrocephalus* with the parent in breed., *C. macrocephalus*, for a period of 21 days (28 days post hatching).

The experimental larvae were produced through induced breeding using HCG at a dose of 3 IU g⁻¹ body weight. The fertilized eggs of treatment 1 were obtained from eggs and sperms of *C. macrocephalus* (M-M). The hybrid B-M larvae were produced from female *C. batrachus* x male *C. macrocephalus* (treatment 2) where as the hybrid M-B larvae were obtained from female *C. macrocephalus* x male *C. batrachus* (treatment 3). The hatching rates were satisfactory for all the groups of eggs ranging from 60 - 88%.

The experiment was conducted with 7 days old larvae in 12 glass aquaria of size 44 x 24 x 22 cm containing a water volume of 10 litre each. Each of the four replicates of each treatment was stocked with 100 larvae. The larvae of all the treatments were fed thrice a day, once with live *Tubifex* spp. and twice with an artificial feed enriched with fish meal and yeast upto satiation as recommended by Alam and Mollah [4].

The mean increase in total length and weight of the larvae at different times of the experimental period is shown in Fig. 1.

The length in mm and weight in mg of the larvae were measured at 0, 7th, 14th and 21st (final) day of the experiment. At 0 and 21st day the individual weight and at 7th and 14th days the collective weight of 20 larvae from each aquarium was taken. The lengths of the larvae were also measured. Analysis of variance test following completely randomized design was used to analyze the data obtained on growth and survival rate of the larvae; the mean values were compared following Duncan's multiple range test at a level of 0.05 [5].

The results on various growth parameters and survival rates at the end of the 3-week rearing period of inbred *C. macrocephalus* (M-M), hybrid between female *C. batrachus* x male *C. macrocephalus* (B-M) and the hybrid, female *C. macrocephalus* x male *C. batrachus* (M-B), larvae are shown in Table 1.

TABLE 1. GROWTH AND SURVIVAL RATE OF INBRED *C. MACROCEPHALUS* AND HYBRIDS BETWEEN FEMALE *C. BATRACHUS* X MALE *C. MACROCEPHALUS* AND FEMALE *C. MACROCEPHALUS* X MALE *C. BATRACHUS* AT THE END OF 21 DAY EXPERIMENTAL PERIOD.

Parameters	Treatment		
	T ₁ (M-M)	T ₂ (B-M)	T ₃ (M-B)
Initial length (mm)	9.35 q 1.78	14.05 q 2.04	12.95 q 2.37
Final length (mm)	30.20 q 1.18	28.05 q 1.37	30.97 q 1.41
Length gain (mm)	20.85 q 1.18	14.00 q 1.37	18.02 q 1.41
	a	b	a
Percentage length gain ¹ (%)	213.90 q 12.61	99.64 q 9.76	139.19 q 10.87
	a	c	b
Initial weight (mg)	14.35 q 4.40	30.70 q 8.42	26.45 q 10.56
Final weight (mg)	193.50 q 28.7	172.80 q 22.90	225.53 q 19.32
Weight gain (mg) ¹	179.15 q 28.7	142.10 q 22.90	199.08 q 19.32
	ab	b	a
Percentage weight gain ¹ (%)	1248.43 q 200.40	462.86 q 86.74	752.65 q 73.05
	a	c	b
Specific growth rate ^{1,2} (% weight gain/day)	12.35 q 0.69	8.19 q 0.62	10.19 q 0.42
	a	c	b
Condition factor ^{1,3}	0.83	0.74	0.71
	a	a	a
Survival rate (%) ¹	83.00 q 3.37	87.75 q 4.03	92.00 q 0.82
	a	ab	a

¹ Figures followed by different letters in the same row are significantly different at P<0.05.

² Specific growth rate = $\frac{\text{Ln of final weight} - \text{Ln of initial weight}}{\text{Period in days}}$

³ CF = $\frac{W}{L^3} \times 10^5$, where W = Weight in g and L = length in mm.

The mean increase in total length and weight of the larvae at different times of the experimental period is shown in Fig. 1.

Length gain of the larvae of T_1 and T_3 did not differ significantly at day 7 and 14, and they were significantly higher ($p < 0.05$) than that of T_2 . Weight gain of the larvae of T_3 was significantly higher than that of T_2 and T_1 at day 7 and 14 while there was no significant difference between the weight gain of the larvae of T_1 and T_2 on both the sampling dates (Fig. 1).

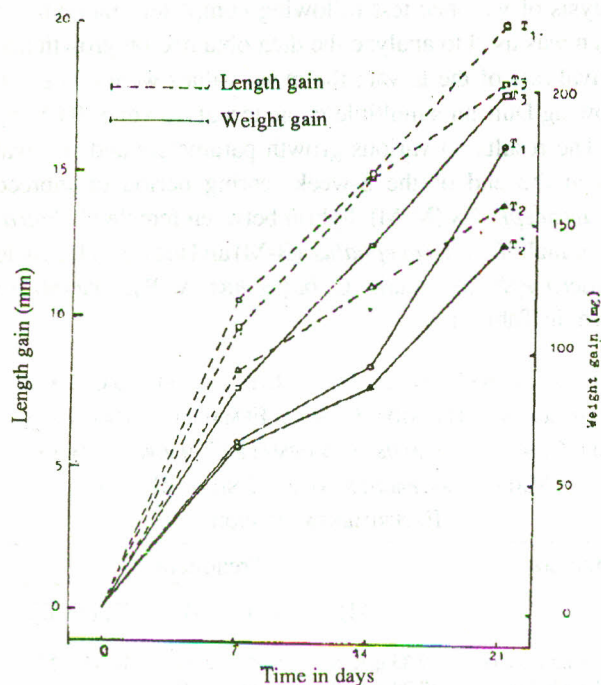


Fig. 1. Length and weight gain of the larvae of various catfish breeds ($T_1 = C. macrocephalus$; $T_2 = C. batrachus$ female x $C. macrocephalus$ male; $T_3 = C. macrocephalus$ female x $C. batrachus$ male).

The survival rate of the larvae of T_3 was highest though there was no significant difference between the survival rates of the larvae of T_3 and T_2 and between T_2 and T_1 (Table 1). In the present study the hybrid M-B i.e. female $C. macrocephalus$ x male $C. batrachus$ showed significantly higher growth rate

than that of the hybrid B-M (female $C. batrachus$ x male $C. macrocephalus$).

Mollah and Nurullah [6] found a length gain of 16.7 mm of $C. batrachus$ larvae having an initial length of 9.9 mm fed on live *Tubifex* spp. at a rate of 3 feeding a day after 21 days rearing. The length gain of 20.85 mm and 18.02 mm of $C. macrocephalus$ and their hybrid M-B, respectively seemed slightly superior to that of $C. batrachus$ larvae observed by Mollah and Nurullah [6]. The growth rate of the hybrid B-M was lower compared to that of M-M as well as the hybrid M-B. This is in agreement of the finding of Reddy and Varghese [7] in case of the rohu and catla hybrids.

The results obtained in the present experiment conducted in aquaria in the laboratory could be different if continued for a longer period in the pond conditions. The discussions reveal that the information so far available regarding growth pattern of various hybrids and their parents are interesting. However, more experiments should be conducted in ponds and for a longer period so that definite results could be obtained.

Key words: Catfish, Hybrids, Larvae, Growth, Survival.

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