

STUDIES ON CROSS - BREEDING OF *CLARIAS*
MICROCARPATUS VS. *C. GARIEPINUS*
AND SOME ASPECTS OF THEIR HYBRID DEVELOPMENT

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March 2004

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STUDIES ON CROSS-BREEDING OF *Clarias macrocephalus* VS *C. gariepinus* AND SOME ASPECTS OF THEIR HYBRID DEVELOPMENT

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March 2004

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A study on identifying the feasibility of producing hybrid catfish progeny through cross-breeding of Asian catfish (*C. macrocephalus*) and African catfish (*C. gariepinus*) were conducted at the Freshwater Hatchery of Kolej Universiti Sains dan Teknologi Malaysia.

Results from three trials of reciprocal cross-breeding clearly showed that hybrid catfish progeny were successfully produced through cross-breed between *C. macrocephalus* female X *C. gariepinus* male (MG). This mating resulted in excellent breeding performances with fertilization, hatching and deformation rates averaged at 83.54%, 86.04% and 5.76%, respectively. However, cross-breed between *C. gariepinus* female X *C. macrocephalus* male (GM) resulted in low fertilization and hatching rates (48.90%, 40.35%)

followed by high deformation rate (74.88%), thus, assumed as not feasible in hybrid catfish production.

Larval rearing of up to 21 days after hatching (dAH) fed with *Artemia* nauplii found that MG hybrid progeny were viable and their survival rate intermediate of both parental species, at an average of 87.33%. However, GM hybrid progeny showed very low survival rate with an average of 10.67%. Besides, MG hybrid progeny showed a better growth rate than both parental species with SGR of $30.11\%h^{-1}$ and $10.87\%h^{-1}$ respectively for increasing of body weight (SGR_{BW}) and total length (SGR_{TL}).

Observation on morphological development indicated that hybrid catfish developed like normal larvae and the period of larval stage is 21 days. Total length of newly hatched hybrid larvae were in average of 4.47 mm and had a yolk sac of 2.35 μ i in volume. The yolk sac would be fully absorbed within 81 hours after hatching (81 hAH) at controlled temperature close to 27.5°C. This hybrid larvae started to ingest external food at 72 hAH. At that time, 3.95% of yolk was still remained and the opening mouth size of larvae were around 0.47 and 0.86 mm at opening angles of 45° and 90°, respectively.

On the other hand, histological study found that hybrid larvae hatched with poor developed digestive system, consisted of a straight undifferentiated tube. At 2 dAH zymogens granules were detected in the pancreas and the stomach started to enlarge at At 3 dAH. However, the gastric glands were only present and started to secrete enzyme at 5 dAH.

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Although feeding with different initial-food that consisted of *Artemia* nauplii, artificial plankton, capsulated micropellet I (particle size of 150-250 μ m), capsulated micropellet II (particle size of 250-450 μ m) and boiled egg yolk did not significantly ($p < 0.05$) effect the survival rate. Live food (*Artemia* nauplii) was found as an excellent initial-food in the rearing of this hybrid larvae in achieving a maximum growth rate. However, weaning to seabass starter-feed after 10 days of *Artemia* feeding was sufficient to achieve a satisfactory SGR_{TL} , while 3 days of *Artemia* feeding were able to maximize the survival rate.

A study on the effects of delayed initial feeding showed that feeding at 3 dAH was observed to be the best. However, delayed initial feeding for three days did not significantly ($p < 0.05$) affect the survival rate.