

**EMBRYONIC AND LARVAL DEVELOPMENT OF  
*PUNTIUS SCHWANENFELDII* (BLEEKER)**

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**Abstract**

Embryonic and larval development of *Puntius schwanenfeldii* (Bleeker) were described under laboratory condition. Eggs were obtained through induced breeding using acetone-dried carp pituitary hormone at 6mg/kg body weight. The fertilized eggs had an average diameter of  $1.02 \pm 0.03$  mm, non-adhesive, demersal and were covered with a thin layer of membrane. The 2-cell egg stage was first observed after 20 minutes of fertilization and by 6hr 20 min the head and tail were noted. Hatching occurred at 16 hrs at 25 C and the length of the newly hatched larvae were  $1.96 \pm 0.03$  mm. Larvae were inactive for most of the time and lay at the bottom of the tank. Organogenesis was completed 30 days after hatching and by this time the juvenile resembled the adults.

**Introduction**

*Puntius schwanenfeldii* (Bleeker) is a cyprinid and is widely distributed throughout Thailand, Malaysia, Sumatera and Borneo (Smith, 1945). The species has commercial importance for it is used as food and aquarium fish. Studies pertaining to aspects of reproduction (Harmin and Gintua, 1995; Harmin et al., 1994;1993) and genetics (Siraj et al., 1994) have been conducted, however; information with regards to the early life development of the fish is not documented. Thus, our objective is to describe the early egg and larval development of *Puntius schwanenfeldii* as a basis for future physiological studies.

**Materials and Methods**

The male and female fish weighing between 130 to 250 g were used and maintained in earthen pond and fed with pelleted feed for approximately a year. Three trials of induced spawning were attempted to produce the larvae, however; only the last trial was used to describe the egg and larval development. A single injection of carp pituitary extract was administered to the females at the rate 6 mg/kg body weight (bw), whereas the males received 3 mg/kg bw to increase spermiation. The eggs were fertilized following the dry method procedure and incubated at water temperature of  $25 \pm 2$  C.

Observation on the embryonic development were based on samples (n=6-7) taken prior to fertilization, and at 5, 10, 15, 30, 60 and 120 post-fertilization until hatching. Larvae were sampled on day 0, 1, 2, 3, 4, 5, 7, 10, 14, 21, 30, 40 50 and 60. Developmental stages were observed using microscope and profile projector. Samples were preserved in 10% buffered formalin.

## Results and Discussion

Unfertilized eggs measured  $0.91 \pm 0.004$  in diameter. Eggs were spherical, greenish yellow in color and non adhesive. First cell cleavage occurred 20 min. after fertilization followed by second cleavage within 30 min after fertilization. Egg diameter increased to  $1.30 \pm 0.009$  mm. and the cell continued to divide rapidly after eight blastomere stage. Morula and blastula stage occurred at 100 min and 180 min, respectively. By 225 min. gastrula appeared and it was observed that there was no significant increased in the egg diameter at this stage. The head and tail region began to appear after 6 hr. 20 min post-fertilization. At 8 hr. the eye vesicle could be observed. The embryo increased in size and somites were visible and followed by the notochord at 10 hr post fertilization.

Hatching began between 12 and 16 hr after fertilization. The hatchlings were transparent and non pigmented. The average length of the larvae were  $1.96 \pm 0.03$  mm. One day old larvae were observed to be still transparent with heart beat between 160-170 per min. The larvae increased in size and the average length measured approximately  $3.70 \pm 0.03$  mm. The number of myomeres observed was between 29 and 31.

On the second day, the larvae appeared to be more active. However, they tended to lay at the bottom of the tank for most of the time, with size increment up to  $3.82 \pm 0.05$  mm. Anal structure was observed and located between the 20th and 21st myomeres. Three-day old larvae measured  $4.12 \pm 0.02$  mm in total length, and began its first exogenous feeding eventhough the yolk sac have not been completely resorbed.

One-week old larvae were very active though still transparent with observable myomeres. Egg yolk was completely resorbed. Melanophores were observed to develop in the head region. By day 10, the larvae were free swimming with average body length increased to  $6.30 \pm 0.16$  mm. and fed entirely on exogenous food.

Melanophores were found all over the head of the two-week old larvae with body length increased to about  $8.34 \pm 0.02$  mm and an inferior mouth was clearly observed. By the third week, the larvae increased in size to about  $12.24 \pm 0.03$  mm. and by one month the total length of the larvae averaged to  $15.6 \pm 0.02$ mm. The body was not transparent and myomeres were not observable any more due to the appearance of some scales on the body. After 2 month, the body length of the fish was  $30.65 \pm 0.06$  mm, weighing  $0.26 \pm 0.01$  g. The body were covered completely with scales and all fin development have been completed. Larvae were more active and swam in groups.

## Acknowledgements

This research was supported by the Ministry of Science, Technology and Environment, Government of Malaysia, under the Intensification of Research in Priority Areas (IRPA), Programme No. 1-07-05-078 entitled Breeding, Culture and Stock Manipulation of Finfish including Aquarium Fishes. The technical help by Nahariah Mat Lia is gratefully acknowledged.

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