

FEEDING BIOLOGY IN EARLY LIFE STAGES
OF GREEN CATFISH, MYSTUS NEMURUS
(CUV. & VAL.)

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DOCTOR OF PHILOSOPHY
UNIVERSITI PUTRA MALAYSIA TERENGGANU
1999

**FEEDING BIOLOGY IN EARLY LIFE STAGES OF
GREEN CATFISH, *MYSTUS NEMURUS* (CUV. & VAL.)**

THUMRONK AMORNSAKUN

Thesis Submitted in Fulfillment of the Requirements for the
DOCTOR OF PHILOSOPHY
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1999

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FEEDING BIOLOGY IN EARLY LIFE STAGES OF
GREEN CATFISH, *MYSTUS NEMURUS* (CUV. & VAL.)

This work is dedicated to beloved :

Father :

PERM AMORNSAKUN

Mother :

AURN AMORNSAKUN

Wife :

SOMRAT AMORNSAKUN

Son :

THUMRONK AMORNSAKUN

And daughter :

SIRIPORN AMORNSAKUN

Thesis Submitted in Fulfilment of the Requirements for the
Degree of Doctor of Philosophy in the
Faculty of Applied Science and Technology
Universiti Putra Malaysia Terengganu

May 1999

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First and foremost, I would like to express my gratitude to Dr. Anuar Bin Hassan who has devoted much of his time and energy in supervising my work and making sure that it goes without a hitch. Without his constant encouragement this

This work is dedicated to beloved:

Father :

PERM AMORNSAKUN

Mother :

AURN AMORNSAKUN

Wife :

SOMRAT AMORNSAKUN

Son :

THEERAPAT AMORNSAKUN

And daughter :

SIRIPORN AMORNSAKUN

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ABSTRAK

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May 1999

Supervisor : Dr. Anwar Bin Hassan

Faculty : Faculty of Applied Science and Technology

Studies were undertaken on some aspects of the feeding biology in the early life stages of the green catfish, *Mystus nemurus* (Cuv. & Val.) in order to get some information fundamental to the developed and improvement of fry production in the hatchery.

Newly hatched larvae were 4.66 ± 0.27 mm in total length, and had large yolk sacs of $1186.00 \pm 250 \mu\text{m}^3$ in volume. The yolk sacs were completely absorbed within 72 hr after hatching at water temperatures between 25 and 30 °C. The mouths of the larvae were open about 26 hr after hatching (5.13 ± 0.73 mm, TL), and measured $183.10 \pm 40 \mu\text{m}$ in mouth height. For the sequence of

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development in the digestive tract, it was straight in 2-day old larvae (6.49 ± 0.43 mm, TL) and it formed a loop in 4-day old larvae (8.54 ± 0.44 mm, TL). The liver could be seen very clearly, and the posterior portion of the digestive tract was curved slightly in front of the rectum when the larvae reached 10 days old (16 ± 1.18 mm, TL), corresponding to the transformation from the larval stage to the juvenile stage. Digestive tracts were fixed with 5 % buffered formalin within 52 hr after hatching with mouth height of 553.40 ± 130 μ m, mouth height started to contain *Moina* (225 ± 76.03 μ m, width) showing that the larvae started feeding when the yolk sac was at 31.20% of its initial volume, and the digestive tract was straight. The first feeding of the larvae were at 40.65% of mouth height at water temperatures of 25-30 °C, consisting of *Moina* (225 ± 76.03 μ m, width). The average number of *Moina* in the digestive tract at the start of feeding was 1.8 ind/larva.

When no feed was given, the larvae started to die in all experiments at 70 hr and all died within 176 hr after hatching at water temperatures ranging between 27.2 and 31.5 °C. There were no significant differences ($P > 0.05$) among the survival rates from no delay in start of feeding (2-day old larvae) to 4 days delay in start of feeding (6-day old larvae).

Larval green catfish of age 2-10 days were fed with *Moina* only, and then completely changed to commercial pellet feed (802.37 μ m in size, 40.87% crude protein) when they were 16 days old. During a transition period, 11-15-day old larvae were fed concomitantly with *Moina* and commercial pellet. The time required to empty the digestive tract of larvae of *Moina* for 3 to 15-day old larvae was in a range of 2 hr 30 min - 4 hr 10 min and decreased with larval age. The time required to fill up the larval gut for 3 to 15-day old larvae was in a range from 1 hr 30 min - 2 hr when the amount of *Moina* in the larval digestive tract was 9.9-68.8 ind/larva. Changes of feeding intensity with the time of day represented by the prey numbers in the digestive tract of the larvae in the stages of 3 to 15-day old tends to be not significantly different between day-time and night-time. The most suitable *Moina* densities for rearing 3, 6, 9, 12 and 15-day old larvae were 1.14, 5.54, 5.63, 5.27 and 7.81 ind/ml, respectively.

There were significant differences ($P < 0.05$) among the increase in total length of larvae fed with three different food densities of ratios 0.5, 1 and 2 for 42 days culture period at water temperatures of 25-30 °C. Food ratio 1 consisted of 5 *Moina* per ml of water or feeding 10 % of body weight with a commercial pellet, 40.87 % crude protein were used. The increase in total length of larvae fed with food densities of ratio 2 was the highest. And there were no significant differences ($P > 0.05$) among the survival rates of larvae with three different food densities of ratios 0.5, 1 and 2.

The level of feeding ration in a week interval for 30-day old (3.54-3.73 cm, TL) to 72-day old larvae (8.00-8.97 cm in total length) were 3.66-9.86 % of body weight, which are optimal as evidenced by very good food efficiency (both food conversion ratio and protein efficiency ratio). And increase in total length, increase in body weight, survival rate, food conversion ratio and protein efficiency ratio from 30-day old to 79-day old fish subjected to different feeding frequencies were not significantly different ($P > 0.05$). Therefore, the optimum feeding frequency to culture green catfish is one feeding daily, which is recommended to reduce labour costs.

Pencipta : Dr. Anwar Sulhanan

Fakulti : Fakultas Sains Gunung Dan Teknologi

Beberapa aspek biologi pemakanan dalam peringkat awal kehidupan ikan baung, *Mystus nemurus* (Cuv. & Val.) telah dibincangkan untuk mendapat maklumat maklumat asas mengenai biologi pemakanan mereka bagi meningkatkan dan mengatubangkan penghasilan benih di pusat penetasan.

Panjang penuh larva ikan baung yang baru menetas adalah 4.66 ± 0.27 mm dan mempunyai kantung kuning telur yang besar berukuran 1186.00 ± 250 μm^2 . Kantung yolk mengucur sepenuhnya dalam masa 72 jam selepas larva menetas dengan keadaan suhu air 25-30 °C. Larva ikan baung mula membuka mulut selepas 26 jam ia menetas (5.13 ± 0.73 mm, panjang penuh) dan ukuran tinggi mulut ialah 183.10 ± 40 μm . Untuk turutan corak perkembangan seluruh penghadaman, ia