Artificial breeding of Greater bony lipped barb *(Osteochilus melanopleura)*

Aquaculture of Indigenous Mekong Fish Species (AIMS), Vietnam Component
Aquaculture Research Center in the Mekong Delta Area
Research Institute of Aquaculture II,
An ThaiTrung commune, Cai Be district, Tien Giang province
E-mail:aimscaibe@hcm.vnn.vn

Introduction

- Greater bony lipped barb belonged to *Osteochilus* specie.
- Widely distributed in different countries, e.g. Indonesia, Thailand, Malaysia, Laos, Cambodia and Vietnam.
- In Vietnam, greater bony lipped barb often appears at the end of the flooding season, from Oct. to Dec.
- It is a herbivorous specie, with algae and aquatic plants as the main feeds. Therefore, it possessed high potentials for small scale freshwater aquaculture.

Introduction (cont.)

Objective:

To identify the artificial breeding and nursing process for greater bony lipped barb (*Osteochilus melanopleura*) farming.

Research activities:

- Maturation growing of broodstock in earthen pond.
- Induced artificial breeding with hormone.
- Development of nursing techniques for fries.

Research methodology

Monitor several hydro-physical and chemical parameters in the broodstock growing ponds:

- Temperature: is measured daily at 7hrs and 14hrs.
- Dissolved oxygen: is measured weekly at 14hrs and 22hrs.
- pH: is measured once a week at 14hrs.
- COD: is measured once a week at 7hrs.

Maturation growing of broodstock in earthen ponds:

Table 1. Growing time of greater bony lipped barb

	2002	2003	2004
Active growing	From Dec. 02 - Mar. 03	From Jan. – Mar.	
Maturation growing	From Apr. – Sep.	From Apr. – Sep.	From Apr. – Sep.

Pond area: 700m2

Farming density: 9 kg/100m2 (11 individuals/100m2).

Table 2. Feed composition for growing greater bony lipped barb

	Active growing	Maturation growing
Bran (%)	40	40
Fish powder (%)	50	50
Blood meal (%)	10	10
Fish oil and vitamin E (%)	1	1
Protein (%)	32	30
Portion (%)	4	2

Management of the farming environment

- Aeration is carried out in the growing ponds every day, from 23hrs to 6hrs of the next day in order to maintain the dissolved oxygen volume greater than 2.5mg/l.

- Water supply is carried out in order to maintain the pond depth of 1-1.2m. Water is changed 1-2 times/month, for about 20-30% of the pond water volume.

- Water is pump for 2 hours/day in the morning for fish stimulation during the maturation growing period.

Study of the sexual system and breeding criteria

- Survey of the breeding criteria: breeding season, maturation rate, maturation coefficient, absolute breeding capacity, relative breeding capacity, ovulation rate, fertilization rate, hatching rate.

Photo 1. Checking maturated broodstocks

Photo 2. Monitoring egg development

Induced artificial breeding with hormone

Table 3. Stimulators used for artificial breeding of greater bony lipped barb

	PG (mg/kg)		LH-Rha (μg/kg)		DOM (mg/kg)
	Preliminary	Decisive	Preliminary	Decisive	Decisive
2002	2.3	4.6		100	10
2003	1.4	2		100	10
2004	1.7	2		100	10

The injection dosage for male fish is equal to a half of that for the female fish

Method for sperm sowing and egg incubation:

- Sperm is sowed by dry method. Eggs are incubated in glass funnel or plastic tank with aeration and running water at low speed.

- Monitoring fish embryo development with optical microscope .

Photo 3. Egg incubation in Wayne tank

Photo 4. Egg incubation in a tank with aeration

Fry nursing

- Part 1: Fries are nursed in a cement tank of 12.5m2, with density of 1,000-1,200 individuals/m2 until they get 20 days of age. Juveniles are then moved to earthen pond of 200m2 for further nursing to be fingerlings.

- Part 2: Fries are nursed to become fingerlings in earthen pond of 700m2, with density of 50 individuals/m2.

Photo 5. Fry nursing in cement tank

Table 4. Feeds used for nursing stages

Days of age	Feeds
1-10	Milk powder + moina
11-20	Broken pellet feeds
21-60	Fish powder + bran

Results and discussion

Hydro-physical and chemical criteria of the growing pond

- Temperature is changed from 29.5 – 36.50C, which turned to be the highest in March and April.
- COD is changed from 6.2 – 13.5 mg/l, which turned to be the highest in Feb., 18.2mg/l
- Dissolved oxygen reached 1.3 – 1.9mg/l in the early morning and 6.8 – 8.2mg/l at the noon time.

Photo 6. Environmental monitoring for the growing pond

Biological breeding characteristics

Photo 5. Several biological breeding characteristics of greater bony lipped barb

Maturation rate (%)	65
Absolute breeding capacity (egg/female fish)	106,700 – 177,975
Relative breeding capacity (egg/kg female fish)	73,586 – 114,823
Number of breeding times per year	1-2
Time for re-maturation	30-120

Feeds used for broodstock growing

Table 6. Compositions of feeds used for growing greater bony lipped barb

	Active growing	Maturation growing
Bran (%)	40	40
Fish powder (%)	50	50
Blood meal (%)	10	10
Fish oil and vitamin E (%)	1	1
Protein (%)	35	30
Portion (%)	4	2

Results of artificial breeding of greater bony lipped barb

Table 7. Results of artificial breeding of greater bony lipped barb

	2002	2003	2004
Effectiveness time (hour)	6-8	5.3 – 6.5	6-7
Actual absolute breeding capacity (egg/kg)	30,874 – 56,472	40,385– 67,550	39,854 – 36,717
Fertilization rate (%)	10.4 – 45.7	40.0 – 64.3	31
Hatching rate (%)	58.9 – 98	49.0 – 50.3	40.59

Results of nursing fries to fingerlings

Table 8. Results of nursing fries to fingerlings with 2-stage method

Growth			Survival rate (%)
Day of age	Weight (g)	Length (cm)	
10	0.08 ±0.02	0.7± 0.2	
20	0.14± 0.06	1.6± 0.5	
30	0.51± 0.31	3.2 ±1.2	
40	1.02 ±0.84	4.5± 1.5	
50	1.71± 0.78	5.2± 1.1	
60	2.48 ±1.24	5.76 ±1.5	43.15

Table 9. Results of fry nursing in earthen pond

Growth			Survival rate (%)
Day of age	Weight (g)	Length (cm)	
10	0.15 ±0.06	1.50± 0.10	
20	0.40± 0.18	1.83± 0.33	
30	1.01± 0.67	4.02 ±0.34	
40	1.4 ±0.9	5.35± 0.51	
50	2.73± 1.21	6.03± 0.38	
60	2.82 ±1.42	6.86 ±0.93	10.3

Photo 7. Fingerlings

Conclusions and Recommendations

- **6.1. Conclusions**

- Breeding season of greater bony lipped barb lasts from April to September, concentrating mostly from May to July.
- The combination of PG stimulator + LH-Rha and DOM gives high and stable results of breeding.
- The relative breeding capacity was not high for the first generation.
- Survival rate, weight, and length of fingerlings nursed with 2-stage method are higher than that of direct nursing in earthen pond.

Conclusions and Recommendations (cont.)

- **6.2 Recommendations**

- To continue study for improving the seed production process, enhancing maturation coefficient and rate of broodstocks, as well as increasing survival rate and weight of fries.
- To implement training and demonstration model for introducing and disseminating this specie.


Thank you very much!