

---

# Culture of Red-tail Mystus, *Hemibagrus wyckioides*, in earthen ponds with different stocking densities

Prangthip PRASERTWATTANA\*, Nongyao MANEE and Sungvien NAMTUM

Yasothon Inland Fisheries Research Development Center, Yasothon Province, and Aquaculture of Indigenous Mekong Fish Species (AIMS), Thailand

---

## ABSTRACT

Experiment on rearing of Red tail Mystus (*Hemibagrus wyckioides*) at stocking densities of 1, 2, 4 fish/m<sup>3</sup> and three replicates in the 400 m<sup>2</sup> earthen ponds were conducted at Yasothon inland fisheries research development centre during November 2003–September 2005. Fish with initial average body length and body weight of 10.7±0.8 cm and 9.1±1.9 g, respectively were fed with 32% protein pellets twice daily for 22 months. Fish were sampled monthly for body weight and body length for calculation of specific growth rate (SGR), survival rate, food conversion rate (FCR), yield and production cost. The results showed that the final average body weight were 309.7±65.4, 253.2±60.6 and 188.6±30.5g; average body length were 33.2±1.5, 31.6±2.7 and 28.9±1.1 cm; SGR were 0.53±0.03, 0.50±0.04 and 0.45±0.02 %/day; survival rate were 74.3±2.2, 80.5±8.0 and 67.8±12.4 %; FCR were 1.79±0.40, 2.20±0.46 and 3.09±0.13 at stocking densities of 1, 2, 4 fish/m<sup>2</sup>, respectively. Statistically, all growth parameters and survival rate of Red-tail Mystus were not significantly different among the treatment (p>0.05). Yields were 85.1±11.8, 145.3±12.2 and 175.9±5.1 kg/pond. Production costs were 132.05, 109.59 and 130.83 baht/kg. From the result, it is suggested that rearing of Red-tail Mystus at stocking rate of 2 fish/m<sup>2</sup> is the most suitable stocking density when production cost is considered.

KEY WORDS: Red-tail Mystus, *Hemibagrus wyckioides*, culture, density

## INTRODUCTION

*Hemibagrus wyckioides* is a high-value species that is popular in cage culture in the Mekong River Basin. Previous experiments conducted by AIMS show the most effective dosage to inducing spawning for natural breeding is 20 µg/kg Buserelin with 10 mg/kg domperidone at 14-15 hours. From a survey of cage culture of Mekong indigenous fish along the Mekong and Songkhram River, Nakhon Panom Province Thailand in 2001-2002, the most commonly cultured species were *Pangasius bocourti*, *P. Conchophilus*, *P. Pleurotaenia*, *Mystus wyckioides* and *M. Nemurus*. *Hemibagrus wyckioides* has been suggested for culture in earthen pond to increase indigenous fish species and replace the use of exotic fish species. The objective of this study is to establish a suitable stocking density in terms of growth rate, yield and production cost of Red-tail Mystus cultured in earthen ponds.

## MATERIAL AND METHODS

The experiment was conducted in 400 m<sup>2</sup> earthen ponds of during November 2003–September 2005 at Yasothon Inland Fisheries Research and Development Center, Yasothon Province using Completely Randomized Design with three treatments and three replicates as follows:

---

\* Yasothon Inland Fisheries Research Development Center, Yasothon Province, Thailand E-mail: yasofish@yahoo.com

- Treatment I      stocking at 1 fish/m<sup>2</sup>
- Treatment II     stocking at 2 fish/m<sup>2</sup>
- Treatment III    stocking at 4 fish/m<sup>2</sup>

Fish with initial average body length and body weight of 10.7±0.8 cm and 9.1±1.9 g were fed twice daily with commercial pellets containing 32% and 30% protein for 22 months. Growth parameters in terms of body weight, body length, specific growth rate (SGR) and water quality were analysed monthly. In addition, feed conversion ratio (FCR), yield and production cost were also analysed.

## RESULT

The results showed that there were no significant differences between the treatments ( $p>0.05$ ) in terms of average final body weight (309.7±65.4, 253.2±60.6 and 188.6±30.5 g), average body length (33.2±1.5, 31.6±2.7 and 28.9±1.1 cm), SGR (0.53±0.03, 0.50±0.04 and 0.45±0.02 %/day), survival rate 74.3±2.2, 80.5±8.0 and 67.8±12.4 % and FCR (1.79±0.40, 2.20±0.46 and 3.09±0.13) at stocking densities of 1, 2, 4 fish/m<sup>2</sup>, respectively.

Yields were 85.1±11.8, 145.3±12.2 and 175.9±5.1 kg/pond. Production costs were 110.26, 96.82 and 120.28 baht/kg. The net profits were -2,727.30, -1,392.90 and -5,422.20 baht/pond.

Table 1. Growth rate of *Hemibagrus wyckioides* culture in earthen pond at 3 different stocking densities

Items	stocking density ( fish/m <sup>2</sup> )		
	1	2	4
Initial length (cm)	10.7±0.80	10.7±0.80	10.7±0.80
Final length (cm)	33.2±1.50	31.6±2.70	28.9±1.10
Initial weight (g)	9.10±1.90	9.10±1.90	9.10±1.90
Final weight (g)	309.70±65.40	253.20±60.60	188.60±30.50
Specific growth rate (%/day)	0.53±0.03	0.50±0.04	0.45±0.02
Survival rate (%)	74.30±2.20	80.50±8.00	67.80±12.40
Food conversion ratio	1.79±0.40 <sup>a</sup>	2.20±0.45 <sup>a</sup>	3.09±0.13 <sup>b</sup>
Yield (kg/pond)	85.1±11.8	145.3±12.2	175.9±5.1

Table 2. Production cost of *Hemibagrus wyckioides* culture in earthen pond at 3 different stocking densities

Items	Stocking density (fish/m <sup>2</sup> )		
	1	2	4
Total fixed costs (baht)	3,883.09	3,883.09	3,883.09
Total variable costs (baht)	7,354.20	12,039.80	19,129.13
Total costs (baht)	11,237.29	15,922.88	23,012.22
Total revenue (baht)	8,510.00	14,350.00	17,590.00
Net profit (baht)	-2,727.30	-1,392.90	-5,422.20

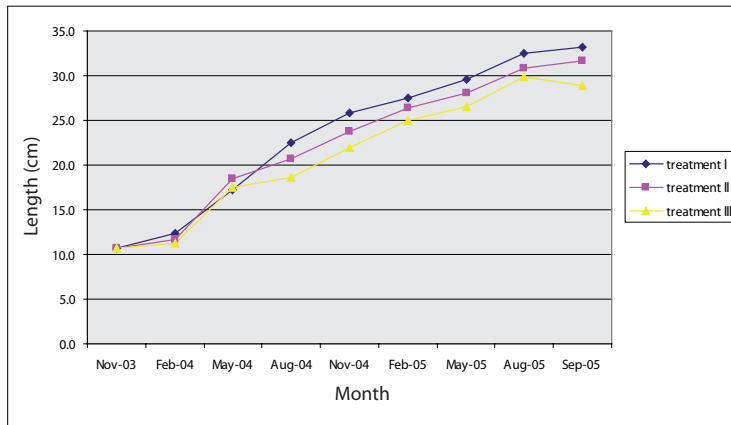


Figure 1. Body length of *Hemibagrus wyckioides* culture in earthen pond at 3 different stocking densities.

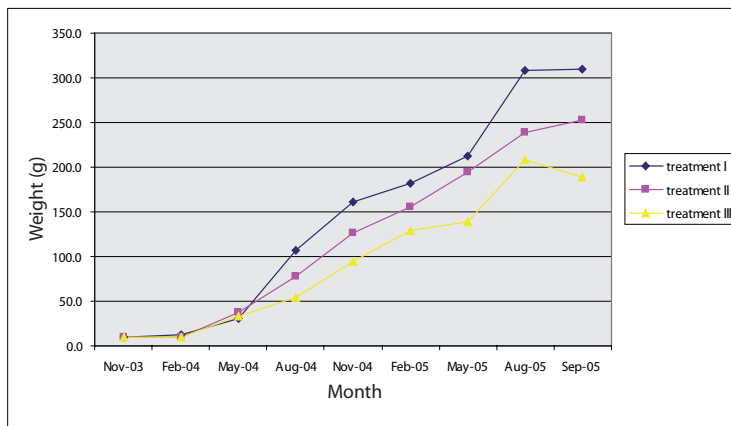


Figure 2. Body weight of *Hemibagrus wyckioides* culture in earthen pond at 3 different stocking densities

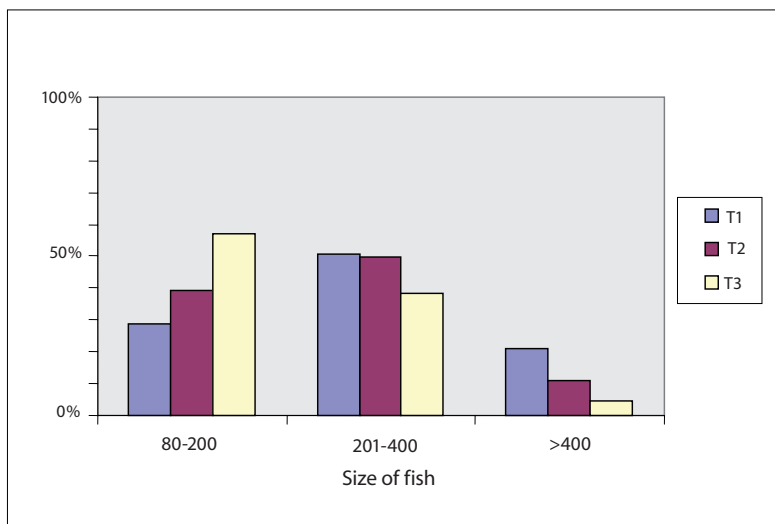


Figure 3. Size of *Hemibagrus wyckioides* culture in earthen pond at 3 different stocking densities

Table 3: Water quality of *Hemibagrus wyckioides* culture in earthen pond at 3 different stocking densities

Parameter	Stocking density (fish/m <sup>2</sup> )		
	1	2	4
Temperature (°c)	21-29	21-29	21-29
pH	6-8	6-8.5	6-8.5
Dissolved oxygen (mg/l)	4-6	4-5	4-5
Alkalinity (mg/l)	34-51	34-51	17-51
Hardness (mg/l)	20-30	20-30	20-30

## CONCLUSION AND DISCUSSION

The results of this experiment suggested that the most suitable stocking density for earthen-pond culture of *Hemibagrus wyckioides* was at 2 fish/m<sup>2</sup> when the production cost was considered. However, stocking density of 1 fish/m<sup>2</sup> was the most suitable stocking density when the final body weight was considered, since more than 70% of fish grow bigger than 200 grams.

The production cost of this experiment was quite high because we used only commercial pellet. An appropriate feeding method should be studied in order to reduce the production cost.

## REFERENCES

- Kasisuwan, S and Sriwatana, W. (1996). Study on cultured of Green Catfish, *Mystus nemurus* (Cuv.&Val.) in Earthen pond Two Different Stocking Densities. Technical paper Songkhla Inland Fisheries Station, Inland Fisheries Division, Department of fisheries, Thailand. 27 pages.
- Prasertwattana, P. *et. al.* (2002) Survey of cage culture of Mekong indigenous fish along the Mekong and Songkhram River, Nakhon Panom Province, Thailand. 5<sup>th</sup> Technical Symposium on Mekong Fisheries, 11<sup>th</sup>-13<sup>th</sup> December 2002
- Ratanatriwong, W. *et. al.* (1998) Preliminary Study on Rearing of Red-Tail *Mystus*, *Mystus wyckioides* (Chaux and Fang), in Water Flow Through Concrete Tank. Technical paper No. 6/1998. Phitsanulok Inland Fisheries Station, Inland Fisheries Division, Department of fisheries, Thailand. 27 pages.