

THE SHRIMP HATCHERY INDUSTRY IN THE PHILIPPINES

Elizabeth Lamera
Aries Hatchery
Oton, Iloilo, Philippines

Fifteen years after SEAFDEC Aquaculture Department first offered its training course on *Barangay Prawn Hatchery Management*, the giant tiger shrimp industry has grown tremendously. Among the private investors in shrimp (*Penaeus monodon*) hatchery is Jamandre Industries, Inc. But problems (e.g., scarcity of spawners and lack of effective artificial feeds) led the company to explore culture of penaeid shrimps other than tiger shrimp. Although survival of *P. stylilostriis* and *P. vannamei* were found to be higher than *P. monodon* in grow-out ponds and in the hatchery, their culture did not take off in the country. For the penaeid shrimps, technology remains largely an art.

The plunge of a major Philippine conglomerate, the San Miguel Corporation, in aquaculture encouraged other big corporations to join the shrimp business, triggering booms in hatchery, farming, feed milling, processing, and other allied industries. Our company expanded in 1982, producing an average of 30 million fry per year. The increasing demand was sustained for five years.

The year 1988 was significant to the shrimp industry in the country. It was when the *1st Congress of the Philippine Prawn Industry* was held, unifying the different industry sectors. It was also the start of the first major crisis faced by the industry for the intensification of pond culture allowed the proliferation of hatcheries throughout the country which in turn caused the decline in the quantity and quality of wild spawners. In addition, broodstock and maturation techniques at that time were not fully perfected yet by hatcheries. These resulted in inconsistent fry supply and widely fluctuating prices.

Due to the failure of hatcheries, younger fry (PL10-15) from the wild are being stocked in ponds, resulting in low survival. The price of wild fry is high because of the middlemen who became necessary since ponds are very dispersed geographically. Nursery operators, most reliable outlet for hatchery-bred fry, limit themselves to certain areas since disposal of juveniles is risky and mortalities are very high. The industry suffered more when disease outbreaks became common. The outbreaks are caused by several factors, but, quality of hatchery fry was blamed the most. Monodon baculovirus (MBV), the most prevalent disease of hatchery-bred fry and pond-cultured *Penaeus monodon*, occurs in 67% of the disease cases. This led the industry to institute a set of criteria for fry quality. However, the different laboratories for shrimp diseases have come out with different criteria (Fig. 1 A-C). But the emphasis was on the

A

Client: _____
 Specimen: _____
 Hatchery: _____
 Broker: _____
 Date submitted : _____
 Laboratory result: _____
 No. of samples : _____

	<i>Criteria</i>	<i>Result</i>
A. Well developed muscles	> 80%	_____
Slightly grainy muscles	< 20%	_____
Spreading muscles	= 0	_____
Spreading chromatophores		_____
Gut rot	< 10%	_____
Gut to muscle ratio	> 1:3	_____
1:3		_____
1:3.5		_____
1:4		_____
1:5		_____
Full gut		_____
Partially full gut		_____
Empty gut		_____

	<i>Criteria</i>	<i>Result</i>
B. Bacterial necrosis	< 3 N/A	_____
Light <i>Leucotrix mucor</i> infestation	< 100%	_____
Moderate <i>Leucotrix mucor</i> infestation	= 0	_____
Heavy <i>Leucotrix mucor</i> infestation	= 0	_____
Light protozoan infestation	< 100%	_____
Moderate protozoan infestation	= 0	_____
Heavy protozoan infestation	= 0	_____
Endoparasites	= 0	_____
C. Body length	= 12.5 - 13 mm	_____
Rostral spine count	= 4 - 6	_____
4 rostral spines		_____
5 rostral spines		_____
Uropods	Spreading	_____
D. MBV occlusion bodies	Negative 100%	_____
	Positive 0%	_____

Presumptive diagnosis using 0.1 malachite green staining:

Noted by:

Analyzed by:

B

Client: _____
 Fry stage: _____
 Date submitted: _____

Pathology		HS	S	LS
Bacterial necrosis	count/ind	— < 2	— < 2.9	—
Filamentous bacteria	% heavy inf.	— < 10	— < 40	—
Protozoans	count/ind	— < 5	— < 9	—
Endoparasites	count/ind	— < 3	— < 5	—
Nematodes	absence/presence	—		
Fungi	absence/presence	—		
Physical condition				
Empty gut	% affected	— < 60	— < 90	—
White body	% affected	— < 60	— < 90	—
Incomplete molting	% affected	— < 60	— < 90	—
Deformities	% affected	— < 60	— < 90	—
Additional criteria for harvestible fry				
Stress test				
MBV diagnosis	(presumptive)	_____		
Muscle development	gut : muscle ratio	_____		
Rostral spine	no. of spines	_____		
Body length	mm	_____		
Spreading uropods	% individual	_____		
Comments:				

Analyzed by:		Noted by:		
_____		_____		
Legend: HS - highly satisfactory; S - satisfactory; LS - low satisfactory				

Fig. 1. Fish health laboratories run by the private sector have different criteria (A, B, and C) in determining quality of fry.

Fry Analysis Summary Report

C

Client: _____ Tank no.: _____ Pop.: _____
 Source: _____ Date received: _____
 PL age: _____

S A M P L E S	Hepato-pancreas		BODY LENGTH	GUT			MUSCLES			GILL			ROSTRUM			APPENDAGES					
	MBV	D-INF Rating		SHG	GN	Rating	MN	GMR	Rating	FBI/PI	N	Rating	RS	RN	N	Rating	RN+N	FBI	PI		
TOTAL	Ave.: _____			= _____			= _____			= _____			= _____			= _____			= _____		
%	x 30% = _____			x 15% = _____			x 10% = _____			x 15% = _____			x 10% = _____			Ave.: _____			x 10% = _____		

Legend: D - INF, degree of MBV infection; SHG, swollen hind gut; GN, gut necrosis; MN, muscle necrosis; GMR, gut-to-muscle ratio; FBI, filamentous bacterial infestation; PI, protozoan infestation; N, necrosis; RS, rostral spine; RN, rostral necrosis; N/A, necrosis per animal.

Total body length (tip of rostrum to tip of telson) = (actual body length - 6) / (theoretical body length - 6) x 100

TOTAL SCORE: _____
 Remarks: _____
 Analyzed: _____ Noted: _____

presence of occlusion bodies as indicator of MBV. MBV-positive fry are hard to sell even at give-away prices. Hatchery operators either exert more effort to produce quality fry or fold up mainly due to lack of financial assistance and technology.

The standardization of fry quality criteria, a major concern, was recently resolved with the adoption of the criteria used by DOLE Philippines and Sarangani Aquaculture Resources, Inc. (Fig. 1C). The fry quality criteria has been correlated to pond performance with 85% success rate.

The slump in the market price of shrimps in 1988-1989, the devastation brought by typhoon Rufing, and the foreign exchange crisis in 1990 reduced the number of growers although others continued but at lower stocking density. Operation on a large-scale basis was not feasible because of marketing problems. Our company survived by limiting production runs from six to three in a year and by constructing small-scale hatcheries.

The Iloilo hatchery operators formed an association known as AHOCI (Association of Hatchery Operators Cooperative of Iloilo), later changed to IFPA (Iloilo Fry Producers Association). Through the *2nd Congress of the Philippine Prawn Industry* in 1991 in Bacolod City, a national organization - SHOP (Shrimp Hatchery Operators of the Philippines) - was formed. The Philippine Government at this time had become a genuine partner in the industry with the creation of the Presidential Coordinating Committee for the Shrimp Industry. The committee includes the representatives of different sectors of the shrimp industry and the Secretaries of the Departments of Agriculture, Finance, and Trade and Industry. Through the committee, the industry hopes to exert significant leverage to avail of government incentives. It can also better coordinate in minimizing the negative effects of unscrupulous business deals. The professionalization of the hatchery industry can be effected and the solution to problems like scarcity of spawners, and larval diseases can be discussed.

Shrimps have become the fastest growing, non-traditional export product of the country. In 1990, earnings reached US\$21.8 million. The shrimps also constitute 3% of Philippine exports of US\$8.1 billion; and 6% of the total world shrimp market (US\$4 billion). The country also ranks fifth as tiger shrimp supplier in Japan. These facts reveal that although the industry is currently in a slump, it has not died yet. There are still other markets to tap and increased production will help the Philippine economy.