PRELIMINARY REPORT ON THE GROWTH RATE OF THE GOBY

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INTRODUCTION

Goby is a very familar fish in Northwestern Luzon, especially in Ilocos Norte, Ilocos Sur, and Abra. The fish is abundant in running waters and lakes of the Ilocos region. However, mature gobies seem to disappear from the rivers and lakes when "ipon" or goby fry starts to appear.

"Ipon" or goby fry appear nine days after the full moon during the months of September, October, November, December, January and February. They are captured by the millions from the mouth of the river by fish traps or fish pots called "bubo" in the dialect. They go upstream and migrate to bodies of freshwater where they stay until they are sexually mature.

Republic Act No. 6145 passed on November 9, 1970, prohibits the catching of goby fry called "ipon" during the months of September to October and February to March in Ilocos Norte. The open season is from November to January every year. Fishermen from "sabangan"* or mouth of the river, follow the movement of the fry upstream up to 15 km to trap them.

The catching or sale of the goby fry is one of the principal means of sustaining the livelihood of Ilocano fishermen. Although they are also able to catch some other fishes in the open seas, this is negligible compared to what they earn during the goby fry season.

People living along the river likewise do extensive preparations on their respective "pingi" or traps before the arrival of the goby fry near their houses. Sometimes during the first or second appearance of the fry as they go upstream in schools, they are so thick and if the river is shallow for lack of rain, the "sabangan" people gets a bonanza. Only a little percentage of the fry can escape their traps.

This fishing process is very lucrative and plays a very important role in the lives of the people. It makes up for the scarcity of the catch from the sea during lean months.

Goby fry or "ipon" command a high price in the market. Fresh and newly caught fry, if brought to the market place immediately, sells for as much as ₱20 to ₱24 per ganta. The market value of the fry decreases as they become stale. However, the demand for stale *ipon* is still great among "bagoong" makers (fish sauce/paste makers).

Mature goby sells from ₱17 to ₱22 per ganta. Try to imagine how many thousands of mature goby, one could get from a ganta of goby fry. Mature goby, when they reach their spawning size, may become a couple of hundred gantas from the original one ganta of fry.

The supply of goby fry is not a problem, as they are easier to obtain than bangus fry. If goby culture could be perfected in ponds, it will immensely boost the fish production campaign of the government and increase the protein supply of the masses in the region.

The culture of goby in ponds, once shown to be viable by government technicians, can induce private fishermen to engage in its culture and production. It is in this light therefore that we propose a larger research program on the growth rate and environmental factors affecting the goby's development under controlled conditions.

Goby fry are very delicious and are usually eaten raw when still fresh. The mature goby have white flesh and excellent flavor.

PROCEDURES

The preliminary study was conducted at the Bobon Seaweeds and other Minor Marine Products Propagation Station, at Burgos, Ilocos Norte. The goby fry used in the experiment were obtained from La Paz, mouth of Padsan River in Laoag City and Bobon Creek, Burgos, Ilocos Norte.

The first collection of samples at La Paz was made on December 9, 1974, and the second was on December 11, 1974. Collection at the Bobon Creek was made on December 13, 1974. Subsequent collections, however, were also done at the creek. The fry were

transported from La Paz to the station in plastic bags filled with oxygen.

It was hot when the first samples were collected. Five plastic bags were used to carry 30,000 fry. The fry were transported at 11:00 a.m. Thirty percent (30%) of the samples survived the heat and crude transportation facilities. The fry were stocked in a 120 sqm concrete tank filled with 1½ ft of fresh water. After 24 hours, only .5% or 30 pieces out of 6,000 fry were alive. The following day however, all the fry perished.

A second collection became necessary and was made on December 11, 1974. Three bags were used containing a reduced capacity of 2,000 pieces per bag. The rate of survival was the same as on December 9. It was observed that fry movement was slow and weak. The mortality after 24 hours was 80% until only 24 pieces were left alive.

On December 13, 1974, collection was made at Bobon Creek but goby fry in this area were not as abundant as those in La Paz. We used a new method of fry collection. In La Paz, "bubo" or pots were used in catching the fry while in Bobon the "dus-dos" or push net was used.

Four thousand pieces of goby fry having an average length of 20.25 mm were immediately stocked in Tank No. 5 while 3,000 pieces were stocked in Tank No. 6. The goby fry in Tank No. 6 had average sizes ranging from 10.66 mm, 15.35 mm to 30.40 mm in length.

The two tanks had been fertilized with chicken manure and commercial fertilizer prior to stocking. The tanks had good plankton growths. Dead corals 6 to 8 inches in diameter were scattered inside the pond. Measurement on the growth of the stocks was done weekly with the aid of a transparent plastic ruler. Weight measurement was not made for lack of weighing equipment. Changing and freshening of the water was done every month.

RESULTS AND OBSERVATIONS

The experiment showed that samples taken from La Paz were short-lived and the high mortality maybe attributed to the means of transportation, the distance travelled, and the time of transportation.

The author believes that another study could be made on other methods of transporting goby fry. The incerase of the temperature of the water in the plastic bag can kill the fry. Temperature therefore plays an important factor in the transportation of goby fry. The number of fry per bag must be considered too. Overcrowding inside the plastic bag results in the high mortality rate. Goby fry are fragile and are very delicate.

The samples from the Bobon Creek increased in size after six months. The result showed that the gobies grew from 20.25 mm to 80.4 mm as shown in Table I. The total increase in size per day ranges from .24 mm to 1.05 mm as reflected in Table II. However, this experiment showed that there were different growth groups.

Different species of goby were used. There was also in-between or intermittent stocking of known lengths.

Table II shows the relative increase in growth per day. The greatest growth increment was 1.24 mm and it was recorded in April, a hot month. Increase in temperature affects the growth of the goby. The natural food supply like phytoplankton became enormous and supplementary feeding (fish meal) was introduced. On April 7, 1975 or midway of the experiment, an increase in space per fish due to mortality was noted. Fish mortality was further affected by the supplementary feeding introduced, the abundance of natural food and also the prevailing hot temperature during the time. Changing of the water and handling of the samples during measurement contributed to the gradual loss of some of the stocks.

On June 25, 1975 or after six months, the number of specimen recovered from Tank No. 5 was 835 pieces or a mortality rate of 79.125%. In Tank No. 6, 400 pieces were recovered showing a mortality rate of 86.66%.

The high mortality rate is attributed to water pollution due to the fowling of the water. The tanks were not provided with aerators and there was no regular flow of water to simulate the conditions in the rivers and streams. Phytoplankton bloom was great. Water refreshing was not done when necessary due to the inadequacy of the water pump and no water hose was available. It was observed also that predators like frogs had invaded the culture tanks.

Up to this writing the gobies which were successfully grown in the concrete tanks showed developed gonads when examined. This

TABLE I. Relative Growth Increment in Millimeters of Various Groups

Tank No. 5

Date of Examination	GROWTH GROUP						
	1	2	3	4	5	6	7
Dec. 13, 1974	20.25						
Dec. 26, 1974	30.38						
Jan. 5, 1975		29.39					
Jan. 15, 1975	40.92						
Jan. 22, 1975		40.54					
Jan. 30, 1975	50.73						
Feb. 16, 1975	.	50.47					
March 8, 1975	80.40						
March 12, 1975			74.22				
March 16, 1975			76.70				
March 23, 1975		70.82					
April 7, 1975		80.36					
April 11, 1975				58.20			
April 15, 1975				60.92			
April 19, 1975					77.42		
April 22, 1975					80.14		
April 26, 1975						73.02	
April 30, 1975				70.72			
May 7, 1975						75.74	
May 11, 1975							70.28
May 15, 1975							73.00
May 22, 1975							80.39

Table I. (Continued)

Tank No. 6

Date of Examination	GROWTH GROUP					
	1	2	3	4	5	6
Dec. 13, 1974	30.41	15.35	10.66			
Dec. 26, 1974	40.53					
Jan. 22, 1975		40.55				
Jan. 30, 1975			40.90			
Feb. 16, 1975			50.78			
Feb. 23, 1975		50.19				
March 12, 1975				34.55		
March 22, 1975				40.82		
April 7, 1975				60.70		
April 11, 1975					50.07	
April 22, 1975					60.96	
April 26, 1975						52.97
May 7, 1975						60.43

TABLE II. Relative Growth Increment per day

Tank No. 5

Date	Number of days interval	Increased growth per day	Total growth increase
GROUP I			
Dec. 13 to Dec. 26	13	.77 mm	10.01
Dec. 26 to Jan. 15	20	.53 mm	10.54
Jan. 15 to Jan. 30	15	.65 mm	9.81
Jan. 30 to March 8	36	.76 mm	27.36
GROUP II			
Jan. 5 to Jan. 22	17	.65 mm	11.15
Jan. 22 to Feb. 16	25	.39 mm	9.75
Feb. 16 to March 23	35	.58 mm	20.3
March 23 to April 7	15	.63 mm	9.54
GROUP III			
March 12 to March 16	4	.62 mm	2.48
GROUP IV			
April 11 to April 15	4	.68 mm	2.72
April 15 to April 30	15	.65 mm	9.79
GROUP V			
April 19 to April 22	3	.9 mm	2.71
GROUP VI			
April 26 to May 7	11	.24 mm	2.71
GROUP VII			
May 11 to May 15	4	.68 mm	2.72
May 15 to May 22	7	1.05 mm	7.38

TABLE II. Relative Growth Increment per day (Continuation)

Tank No. 6

Date	Number of days interval	Increase in growth per day	Total grown increase
GROUP I			
Dec. 13 to Dec. 26	13	.77	10.11
GROUP II			
Dec. 13 to Jan. 22	40	.63	25.2
Jan. 22 to Feb. 23	32	.30	9.64
GROUP III			
Dec. 13 to Jan. 30	48	.63	30.24
Jan. 30 to Feb. 16	17	.58	9.67
GROUP IV			
March 12 to March 22	10	.62	6.27
March 22 to April 7	16	1.24	19.88
GROUP V			
April 11 to April 22	11	.99	10.89
GROUP VI			
April 26 to May 7	11	.67	7.45

aspect may lead to another study on the spawning of goby under controlled conditions.

RECOMMENDATIONS

It is recommended that subsequent studies on the growth rate of the different species of goby and their feeding habits be made. The author feels these moves are necessary to perfect the techniques of culturing gobies in ponds. This preliminary study had shown good results and had proven that goby could be cultured in ponds.

From the results of the experiment, it was shown that pond culture of goby has a bright future. The maintenance of gobies is somewhat similar to other fishes where operational and maintenance expenses are limited. Raising gobies in pond can both be practical and economical. This may be the first attempt to culture gobies in concrete tanks and it was accomplished with some measure of success.

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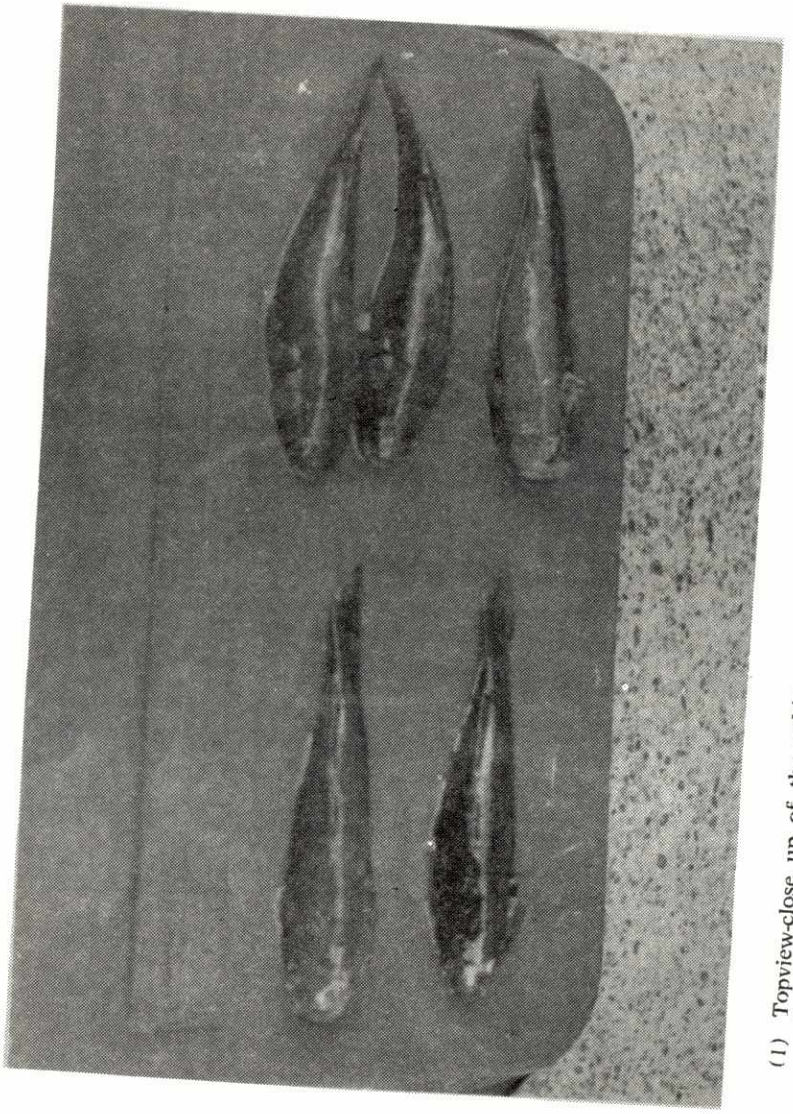
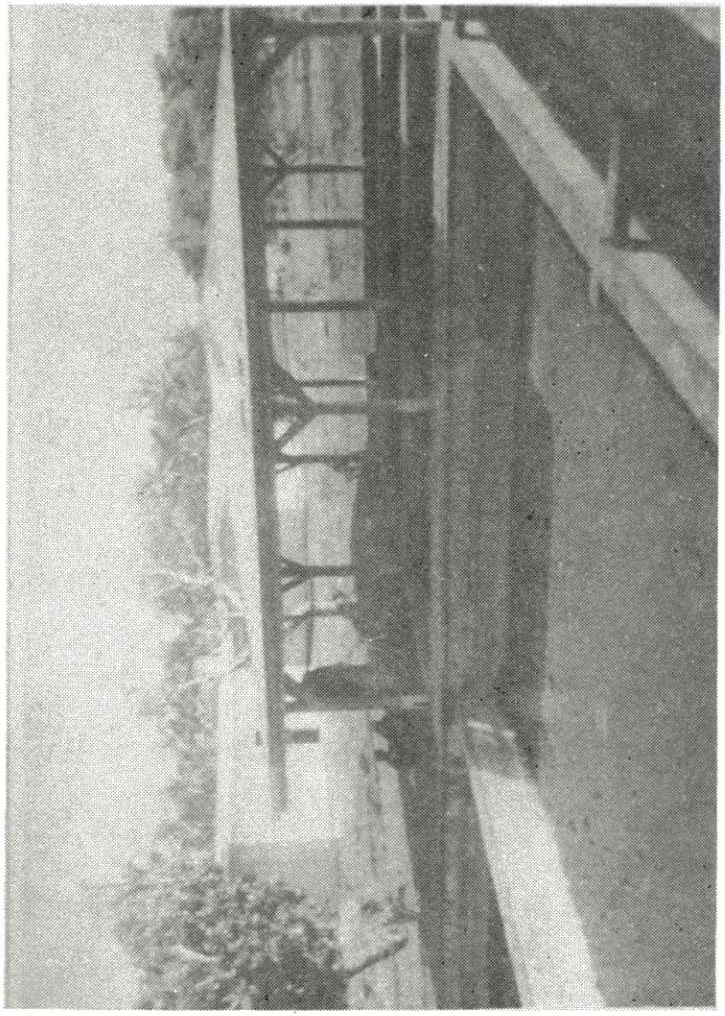


(1) Topview-close up of the gobies grown in concrete tanks at the Bobon Seaweeds and other Minor Marine products Propagation Station at Burgos, Ilocos Norte.

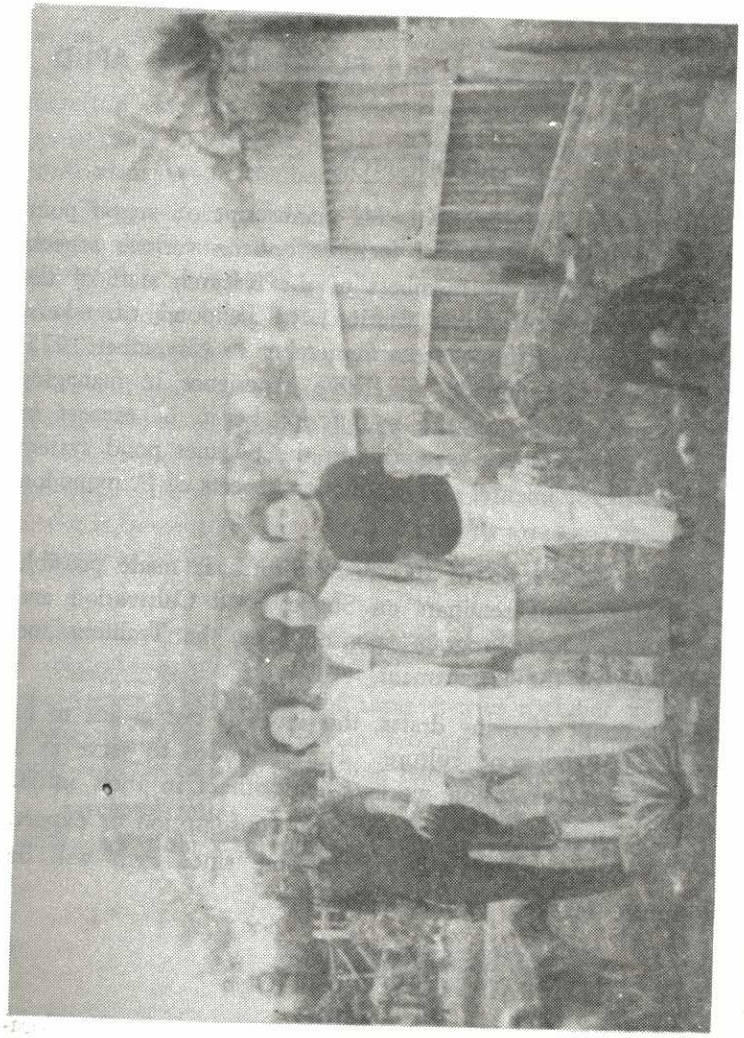
(2) The full-grown gobies are held in a porcelain basin for weighing and measuring.

(3) Fishpod caretakers in Bobon use a net in catching the gobies from the concrete tanks.



(4) Full view of the concrete tanks where the goby experiments were conducted

(5) Antonia de Luna, Senior Fishery Biologist and Mr. Albano compare notes on the growth increment of the gobies.



(6) The personnel of the Bobon Seaweeds and Minor Marine Products Station in Burgos, Ilocos Norte, left to right: Sadiri T. Robianes, Security guard; Antonia de Luna, Senior Fishery Biologist; Pella G. Jara, Fishery Aide, and the author, who is the Officer-in-charge.