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Growth and Survival of Snubnose Pompano (*Trachinotus blochii* LACEPÉDE) Cultured in Floating Netcages with Different Protein Diets

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ABSTRACT

Snubnose pompano (*Trachinotus blochii*) is one of the potential species for aquaculture because of its tasty meat, fast growth rate, and appealing appearance. Despite such potential, there are insufficient information on the growth, survival and nutritional requirement of this species. A 45-day feeding experiment was conducted with snubnose pompano (initial body weight of 2.61-2.68g and initial total length of 5.10-5.20cm) to determine the effects of different protein diets on its growth performance, feed conversion ratio (FCR), and survival at the Western Philippines University Fishcage Project, Tiniguiban Cove, Puerto Princesa City, Palawan. Fishes were fed four types of diets: formulated Diets I (25% CP) and IV (30% CP); and commercial feeds, Diet II (25% CP) and Diet III (28% CP). Fish exhibited better growth performance ($P<0.05$) with commercial feeds (Diets II and III) although FCR is not significantly different among treatments. Growth and survival of *T. blochii* fingerlings generally increased with increased dietary protein level. It is recommended that further study be conducted using higher protein content diet as feed for *T. blochii* within a longer culture period.

Keywords: snubnose pompano, protein requirements, fish nutrition, netcage culture

INTRODUCTION

Snubnose pompano belongs to family Carangidae (jacks and pompanos), order Perciformes (perch-like), Actinopterygii (ray-finned fishes). It is known scientifically as *Trachinotus blochii* and locally as pompano or pampano. It is characterized by 7 dorsal spines; 18-20 dorsal soft rays; 3 anal spines; and 16-18 anal soft rays. The color is generally silvery, paler below with large adults mostly golden orange, especially ventrally. Dorsal snout profile is very steep; soft dorsal and anal fin lobes are greatly elevated.

Pompano is one of the popular species cultured by the local aquafarmers so that pompano culture industry has developed very quickly in this decade. Since this fish can be stocked in netcages, it is expected to become a profit-industry. Although

T. blochii is an important species for aquaculture, because of its tasty meat, fast growth rate, and appealing appearance, information on its growth, survival, and nutritional requirements is limited. In the Philippines, no study had been conducted regarding the growth and survival of *T. blochii*. Further, study on its feed requirements is very limited.

The present study was conducted to determine the growth performance and survival of *T. blochii* cultured in floating netcages and the effects of different protein diets on the feed conversion ratio.

MATERIALS AND METHODS

Experimental Site

This study was conducted at Western Philippines University Fishcage Project, Tiniguiban Cove, Puerto Princesa City, Palawan (Fig. 1) for 45 days from December 13, 2004 to January 28, 2005.

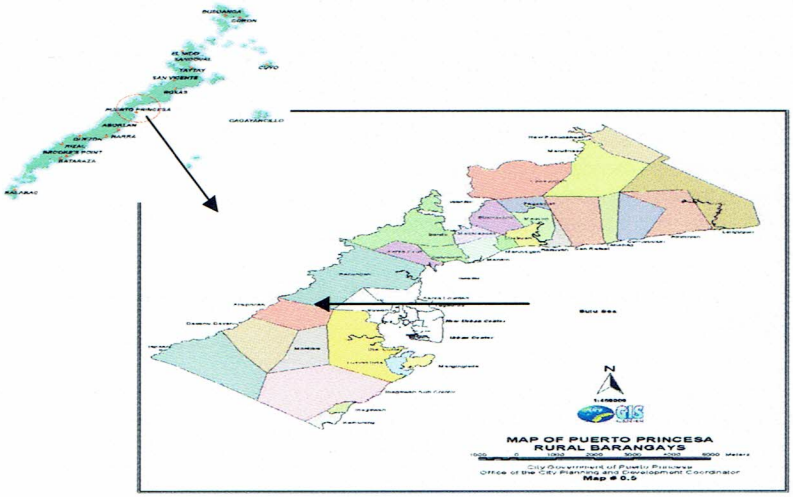

Figure 1. The experimental site at WPU-PPC Fishcage Project, Tiniguiban Cove, Puerto Princesa City, Palawan.

Feeds and Feeding Management

Fishes were fed with four types of diet during the culture period. The feed used for Diets I (25 % CP) and IV (30 % CP) were formulated feeds that were processed at WPU-PPC Aquaculture Laboratory, while Diets II (25% CP) and Diet

III (28% CP) were the commercial feeds purchased from local feed suppliers n Puerto Princesa City. The composition of four experimental diets is shown in Table 1. During the feeding trial, feeding rates were adjusted to 20%, 15% and 10% body weight during the first 15th, 30th, and 45th day of the culture period respectively.

Stock Management

Snubnose pompano was bought from Taiwan on November 2004 and stocked at the Oceanus Aqua Venture Fishcage Project in Tiniguiban Cove, Puerto Princesa City. About 400 fingerlings with an initial body weight of 2.59-2.68g and initial total length of 5.10-5.20cm were transferred to WPU-PPC Fish cage Project for conditioning. Pompano fingerlings were fed with trashfish mixed with formulated diets for 15 days. The fish were then randomly distributed into 12 netcages made of b-net attached into a raft framework measuring 1.0m x 1.0m x 1.5m with a stocking density of 25pcs/m^3. A perimeter net and sinkers were provided in every cage. The cages were randomly distributed in a Completely Randomized Design.

The fish were sampled every 15 days by measuring the total length and weight them using the improvised measuring board and Vernier caliper, and Yamato weighing scale, respectively. Fish stocks were also counted to determine the mortality.

At the end of the feeding trial, all fish were weighed, measured, and counted to determine their growth and survival.

Water Parameter Analysis

Water parameters such as salinity, temperature, pH and dissolved oxygen were also monitored using refractometer, thermometer, portable pH meter, and DO meter, respectively.

Data Analysis

Data gathered were analyzed using Analysis of Variance and significant differences were determined using Duncan Multiple Ranged Test (Gomez and Gomez 1984). Data were computed using the following formulae.

1. Weight Gain = Wi – Wo
2. Condition Factor (K) = ABL^3/ABW
3. Specific Growth Rate = Ln (W1-Wo)/d x 100
4. Feed Conversion Ratio = F1/(W1-Wo) x (N1+No)/2 x 100

5. Survival Rate = Total fish harvested/Total fish stocked x 100

Table 1. Composition of test diets.

Treatment	Type	Crude Protein	Ingredients	Composition (g/100 g dry weight)/Proximate Analysis
I	Formulated	25	Fish meal, copra meal, corn meal, flour, starch and vitamin	Fish Meal 22.00 CPM 56.00 CRM 5.00 Flour 5.00 Starch 10.00 Vitamin 2.00
II*	Commercial	25	Soy bean, copra meal, wheat, corn, poultry meal, fish meal, limestone, monodicalcium phosphate, amino acid, vitamin and mineral, banana meal, cassava meal, animal and vegetable oil	Crude protein 25%NLT Crude fat 6%NLT Crude fiber 7% NMT Moisture 13% NMT Crude ash 16% NMT
III*	Commercial	28	Fish meal, fish soluble, fish oil, soy meal, wheat flour, brewers yeast, molasses, rice bran, polard, copra meal; vitamin and mineral premix, mold inhibitor and anti-oxidant	Crude protein 28% min Crude fat 2% min Crude fiber 9% max moisture 12% max
IV	Formulated	30	Fish meal, copra meal, corn meal, flour, starch and vitamin	Fish Meal 34.5 CPM 43.5 CRM 5.0 Flour 5.0 Starch 10.0 Vitamin 2.0

*copied from the labeled

RESULTS AND DISCUSSION

Fish fed with Diets II and III attained weight significantly ($P<0.05$) better than those fed with Diet I but not Diet IV. Also fish fed with Diets II and III grew significantly ($P<0.05$) longer than those fed with Diets I and IV. The weight gain and SGR of those fed with Diets II and III were significantly ($P<0.05$) higher than with Diet I. The FCR for all treatments were not significantly different. Fish fed

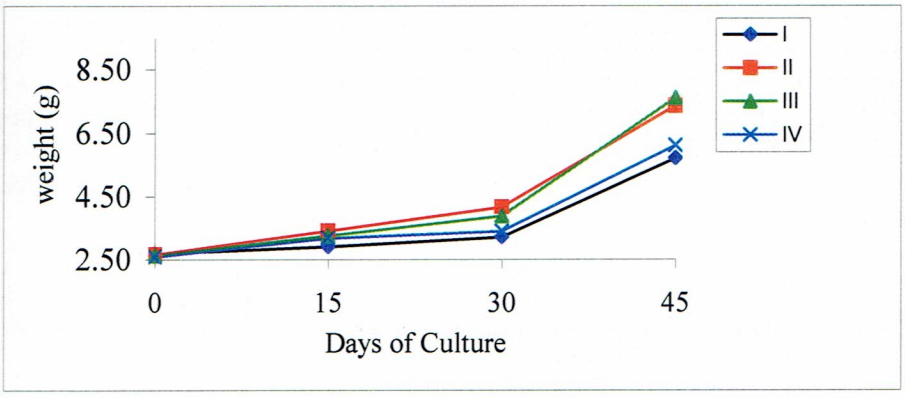

Figure 2 Average body weight of *Trachinotus blochii* after 45 days of culture in floating netcages in Tiniguiban, Cove Puerto Princesa City.

Table 2. Growth performance of *Trachinotus blochii* after 45 days of culture in floating netcages in Tiniguiban Cove, Puerto Princesa City.

Characteristics	Treatments			
	I	II	III	IV
Initial Weight^{ns}	2.68±0.51^{a}	2.65±0.27^{a}	2.61±0.36^{a}	2.59±0.29^{a}
Initial Length^{ns}	5.10±0.32^{a}	5.17±0.10^{a}	5.20±0.25^{a}	5.06±0.16^{a}
Final Weight**	5.72±0.62^{c}	7.38±0.47^{ab}	7.63±0.57^{a}	6.13±0.79^{bc}
Final Length**	5.40±0.14^{b}	6.63±0.38^{a}	6.34±0.20^{a}	5.70±0.12^{b}
Weight Gain*	3.04±0.78^{c}	4.72±0.62^{ab}	5.01±0.94^{a}	3.54±0.56^{bc}
SGR*	1.87±0.39^{b}	2.37±0.18^{ab}	2.56±0.23^{a}	1.91±0.15^{b}
K**	3.64±0.33^{a}	2.55±0.38^{b}	3.00±0.19^{ab}	3.29±0.22^{a}
Initial Biomass^{ns}	67.00±12.77^{a}	66.33±6.66^{a}	65.33±9.07^{a}	64.67±7.23^{a}
Final Biomass^{ns}	66.33±10.79^{a}	69.33±15.95^{a}	70.00±52.74^{a}	137.00±26.91^{a}
FRS	7.65±3.12^{a}	5.50±0.61^{a}	5.30±1.48^{a}	5.56±0.53^{a}
Survival**	46.67±9.24^{b}	37.33±6.11^{bc}	36.00±24.98^{c}	89.33±11.55^{a}

Treatment means in each growth characteristics followed with the different letters are significantly different (*=0.05;**=0.01).

with Diet IV had significantly (P>0.01) higher survival than with the rest. Water parameters determined were within the normal range required for the cultured fish.

During the acclimatization period the fishes readily accepted all diets. However, the total diet seems still very low than the required protein for pompano. Since pompano is a carnivouros fish it is reported that the protein content must be at a range of 40-55% (NRC 1983, Steffens 1989).

Results indicated that the weight gain of snubnose fed with Diets II and III significantly (P<0.05) than the fishes fed with Diet I but not in Diet IV. The SGR of the *T. blochii* fed with Diet III is significantly (P<0.01) higher than the fishes fed with Diet I and IV but not with Diet II (Table 2 and Fig. 3). The K of fishes fed Diets I, III and IV were significantly different than fish with Diet II. However, in general fishes are in good condition.

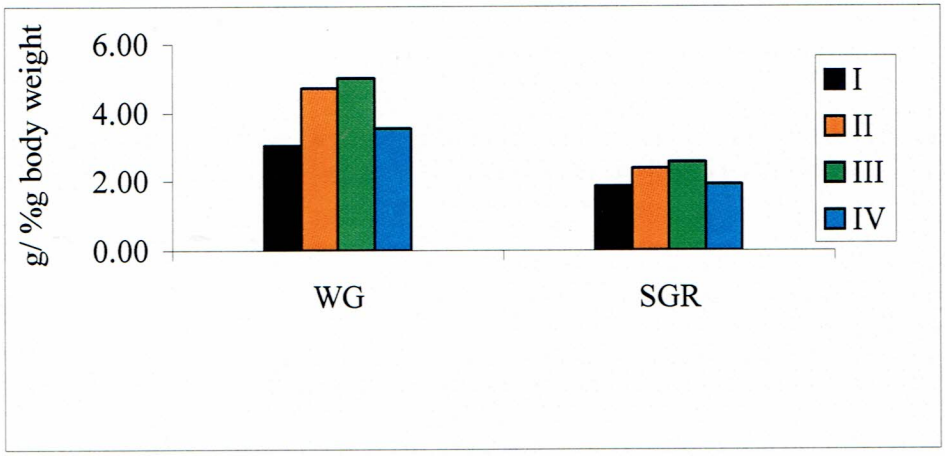

Figure 3. Weight gain and SGR of *T. blochii* after 45 days of culture.

The FCR ranged from 5.56-7.65 and are not significantly different in all treatments. Reports indicated than even Florida Pompano exhibited lower FCR than other marine species (Lazo et al. 1998, Serrano et al. 1992). *Trachinotus* were observed to be a fast swimmer fish hence it is possible that the energy required to maintain this swimming activity reduced the available amount of energy for growth and consequently reduced the FCR. In terms of survival- rate, only those fishes fed with Diet IV obtained significantly (P>0.05) higher survival as compared with those fed with other diets (Table 2 and Fig. 4).

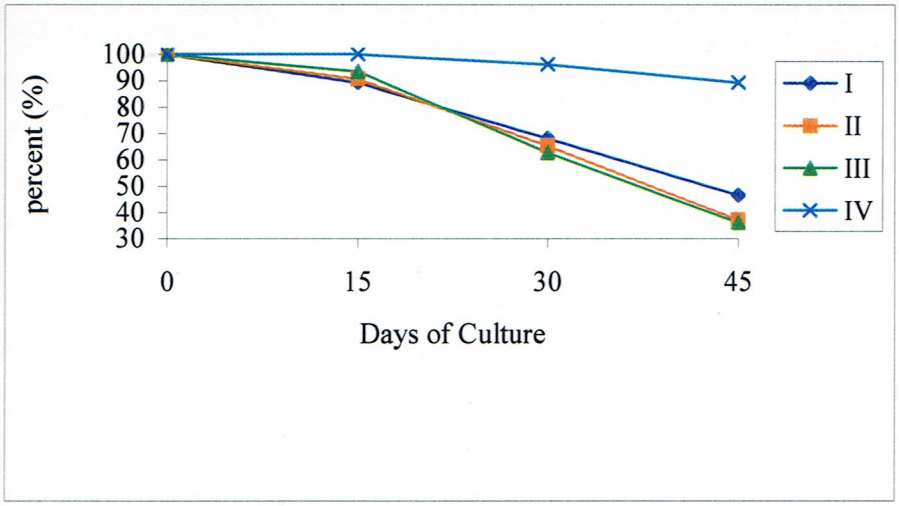

Figure 4. Survival rate of *T. blochii* after 45 days of culture in floating netcages at Tiniguiban Cove, Puerto Princesa City.

CONCLUSION AND RECOMMENDATION

This study indicates that snubnose pompano fingerlings require higher protein content diet. For optimum growth and higher survival rate, higher protein content diet must be provided to the fingerlings. A follow-up study with higher than 30% CP diet to be conducted for a longer rearing period is recommended.

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