



UNIVERSITI PUTRA MALAYSIA

***EFFECT OF STOCKING DENSITY ON SURVIVAL AND GROWTH OF
ENDANGERED SNAKEHEAD (*Channa striatus*) IN TANK CULTURE***

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**This project is submitted in partial fulfilment of the requirements for the
degree of Bachelor of Agriculture (Aquaculture)**

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2012

CERTIFICATION OF APPROVAL
DEPARTMENT OF AQUACULTURE
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This is to certify that I have examined the final project report and all corrections have been made as recommended by the panel of examiners. This report compiles with the recommended format stipulated in the AKU4999 project guidelines, Department of Aquaculture, Faculty of Agriculture, Universiti Putra Malaysia.

Signature and official stamp of supervisor.

Dr. S.M. Nurul Amin

Date:

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ABSTRACT

Growth performance and survival of *C. striatus* at different stocking densities in tank were investigated. The three different stocking densities were used in this experiment, 20pcs/m², 30 pcs/m² and 40 pcs/m². There were three replicates for each treatment. Fingerlings were reared for 18 weeks in tank size 2.5m x 1.3m x 0.75m and given formulated feed 43% of protein twice a day with 6% of body weight. Water quality parameters were measured every week during the experiment. Results showed that there was significant difference ($P < 0.05$) on growth among the treatments. The growth performance was significantly higher in T₁ than in T₂ and T₃. However, the survival rate showed no significant difference ($P < 0.05$) among all the treatments. The food conversion ratio (FCR) value among the treatments was significantly lower ($P < 0.05$) in T₁ than T₂ and T₃. Therefore, the highest growth and FCR of *C. striatus* culture was with stocking densities 20 pcs/m². Water quality measurements range for temperature, DO, pH and ammonia is 26.3-26.57 °C, 5.15-5.27 mg/L, 6.32-6.92, 0.91-1.73 mg/L respectively.

Keyword: Fingerlings, water quality parameters, survival rate

ABSTRAK

Peningkatan pembesaran dan kadar hidup bagi *Channa striatus* di dalam kepadatan stoking yang berbeza di dalam tangki telah dijalankan. Tiga kepadatan stoking yang berbeza digunakan didalam kajian ini, 20pcs/m², 30 pcs/m² dan 40 pcs/m². Tiga replikasi telah disediakan untuk setiap rawatan. Rega ditenak selama 18 minggu di dalam tangki bersaiz 2.5m x 1.3m x 0.75m dan diberi makan berformula 43% protein dua kali sehari dengan kadar 6% dari berat badan. Parameter mutu air telah diukur setiap minggu semasa kajian dijalankan. Keputusan menunjukkan terdapat perbezaan bererti ($P < 0.05$) pada pembesaran dikalangan rawatan. Peningkatan pembesaran telah menunjukkan perbezaan lebih tinggi pada T₁ berbanding T₂ dan T₃. Walau bagaimanapun, kadar hidup menunjukkan tiada perbezaan bererti ($P < 0.05$) diantara semua rawatan. Nisbah pertukaran makanan adalah rendah ($P < 0.05$) pada T₁ berbanding T₂ dan T₃. Justeru, pembesaran dan FCR bagi *C. striatus* dikultur dalam tangki berada pada kadar optimum pada kepadatan stoking 20 pcs/m². Keputusan mutu kualiti air bg suhu, DO, Ph and ammonia nitrit adalah 26.3-26.57 °C, 5.15-5.27 mg/L, 6.32-6.92, and 0.91-1.73 mg/L.

Kata kunci: Rega, Parameter mutu air, kadar hidup

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LIST OF ABBREVIATIONS/ SYMBOLS

%	Percentage
°C	Degree celcius
cm	centimeter
DO	dissolved oxygen
g	gram
mg/L	milligram per liter
m	meter
RAS	recirculating aquaculture system
f/m ²	fingerlings per meter square
pcs/m ²	pieces per meter square

CHAPTER 1

INTRODUCTION

Snakehead (*Channa striatus*) from the family Channidae is one of the carnivorous freshwater fishes which consume frogs, fish, snakes, insects, earthworms and tadpoles (Rahman *et al.*, 2012a). The carnivorous behaviour can be seen at early fry stage. This fry can start feeding on zooplankton and change their feeding habit to eat small crustacean, insect and insect larvae at juvenile stage.

Snakehead use to build nest for their breeding. The preparation of nest is important by clearing an area of the water surface of aquatic and emergent by parent fish. The male parent will guard closely to fertilized eggs at the water surface until the eggs hatch and school break. After hatching of two days, fry snakehead can start swim vertically with right side up. Snakehead can reach length one meter in nature environment.

It is cultured commercially in Philippines, Thailand, Taiwan, and India (Wee, 1982). The type of feeding habit of snakehead is one of the reasons why people do not culture it. The cost may expensive compare with the food from pellet for other fishes. This is because the value of protein is different. Nowadays, most commercial snakehead culture relies on capture of wild fry, and then trained them to accept formulated feed which consists of fish paste and rice bran or wheat flour (Diana *et al.*, 1985).

In Taiwan, Hong Kong, India and Bangladesh were successfully culture snakehead species in earthen pond such as *Channa maculatus* and *Channa punctatus* (Wee, 1982; Rahman *et al.*, 2012a).

Snakehead has long been regarded as valuable food fish and widely cultured in the Far East (Wee, 1982). It contains many amino acids that help to speed healing wound whether internally and externally. Nowadays, many products based on the snakehead fish such as in form of tablet, oil and cream. Snakehead can help to speed the growth of cells and delay the death cells in the body. This because the essential amino acids to produce proteins in the body.

Snakehead is highly predaceous that they can swallow whole of their prey (Diana *et al.*, 1985). To culture snakehead, we must know which culture method is suitable for it. With previous experiment of Diana *et al.* (1985), the monoculture of snakehead juveniles stocking density range is 40 to 80 m⁻², with typical survival about 13-15 % after 9-11 months in pond. However, it not clear shows the growth of snakehead is affected by stocking density. Other than that, there is no previous research which successfully cultured snakehead in tank.

Thus, the objectives of this research were:

1. To investigate the survival rate of snakehead in different stocking densities in tank.
2. To determine the growth performance of snakehead with different stocking densities in tank.



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Book, Book Chapter, Journal, Proceeding

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