



**UNIVERSITI PUTRA MALAYSIA**

***GROWTH AND GONADAL DEVELOPMENT OF KERAI LAMPAM  
CULTURED IN CONTROL ENVIRONMENT***

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

**DEPARTMENT OF AQUACULTURE  
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**2016**

**CERTIFICATION OF APPROVAL**  
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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 complies with the recommended format stipulated in the AKU4999 project guidelines, Department of Aquaculture, Faculty of Agriculture, Universiti Putra Malaysia.

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## ABSTRACT

Kerai Lampan is a hybrid between Kerai *Hypsibarbus wetmorei* (Smith, 1931) male and Lampam Jawa *Barbonymus gonionotus* (Bleeker, 1846) female. Market price for Kerai Lampam is quite high at MYR25/kg. Even as a popular cultured food fish, there is no documented report on the growth, survival and gonadal development of Kerai Lampam. Therefore, the objectives of this study were to observe the growth, survival and gonadal development of Kerai Lampam cultured from 2 to 9 month-old. A total of 300 fry with weight  $0.10 \pm 0.08$ g and length  $1.87 \pm 0.32$ cm produced at the Institute of Bioscience hatchery, UPM, Serdang, Selangor, were cultured for 9 months period. The growth of these fingerlings was measured monthly based on their length and weight. Survival was noted throughout the study period. Gonads from ten fish were sampled randomly on monthly basis for histological observation starting from 4 month-old. At the same time fishes were also observed for their morphological differentiation. Fish achieved weight of  $6.73 \pm 0.52$ g and length of  $9.86 \pm 0.27$ cm at 9 month-old. However, no morphological differences observed to differentiate male and female fish at this stage. As for gonadal development, no mature ovary or testis was observed through the histological samples. Based on these findings, it can be concluded that at 9 month-old, Kerai Lampam is still at immature stage, therefore cannot be used for reproduction.

**KEY WORDS:** Kerai, *Hypsibarbus wetmorei*, Lampam Jawa, *Barbonymus gonionotus*, growth, gonadal development, Kerai Lampam

## ABSTRAK

Kerai Lampam merupakan species hybrid diantara induk jantan Kerai *Hypsibarbus wetmorei* (Smith, 1931) dan induk betina Lampam Jawa *Barbonymus gonionotus* (Bleeker, 1846). Pasaran harga untuk Kerai Lampam agak tinggi iaitu MYR25/kg. Walaupun telah menjadi ikan ternakan yang popular, namun tiada maklumat untuk tumbesaran, kemandirian dan perkembangan gonad bagi spesis ini. Oleh itu, objektif kajian ini adalah untuk memerhati tumbesaran, kemandirian dan perkembangan gonad Kerai Lampam dari umur 2 hingga 9 bulan. Sebanyak 300 fri dengan berat  $0.10 \pm 0.08$ g dan panjang  $1.87 \pm 0.32$ cm telah dihasilkan di unit hatcheri Institut Biosains, UPM, Serdang, Selangor, dikultur selama 9 bulan. Tumbesaran ikan ini diukur setiap bulan berdasarkan berat dan panjang keseluruhan. Kemandirian dicatat sepanjang tempoh kajian. Gonad telah diekstrak dari 10 ekor ikan yang dipilih secara rawak bermula dari umur 4 bulan. Pada masa yang sama perubahan morfologi turut diperhatikan. Kerai Lampam telah mencapai berat  $6.73 \pm 0.52$ g dan panjang of  $9.86 \pm 0.27$ cm pada umur 9 bulan. Walaubagaimanapun, tiada perbezaan morfologi diantara ikan jantan dan betina pada peringkat ini. Untuk perkembangan gonad, tiada ovari atau testis matang dilihat melalui sampel histologi. Berdasarkan hasil kajian ini, kesimpulannya pada umur 9 bulan, Kerai Lampam masih belum mencapai peringkat kematangan, oleh itu tidak boleh digunakan untuk pembiakan.

**KATA KUNCI:** Kerai, *Hypsibarbus wetmorei*, Lampam Jawa, *Barbonymus gonionotus*, tumbesaran, pembentukan gonad, Kerai Lampam

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## LIST OF ABBREVIATIONS

cm	- Centimetre
DO	- Dissolved Oxygen
DPX	- Mixture of distrena, plasticizer and xylene
g	- Gram
kg	- Kilogram
L	- Litre
mg	- Milligram
°C	- Celsius
µm	- Micrometre
min	- Minute
sec	- Second
SE	- Standard error

# CHAPTER 1

## INTRODUCTION

### 1.0 Introduction

Aquaculture plays an important role in the economy of Malaysia. Malaysia for many decades has become one of the biggest fish producers in Southeast Asia. Fish was consumed as one of the main sources of protein for human consumption. Meanwhile, Dey *et al.* (2004), FAO (1999), Dey (2000a), Dey *et al.* (2000b), ICLARM (2000) stated that, since fish contain high level of protein and relatively low price, making it popular among the lower income groups. Heavy fishing activities includes, capture of fish from the sea, river or lakes, lead to the depletion of fish resources. The world's fish stock has been exploited widely, it is difficult to increase yields from capture fisheries (Williams, 1996). However, according to FAO (2000), fisheries sector has been raising at a fast rate, about 5% per year during the 1950s and 1960s to 8% during the 1970s and 1980s and over 10% since 1990.

In Asian countries, fish has become the main source of protein evidenced by 30% of the total animal protein intake is gained from fish. A remarkable increase in production with a relatively low prices and unlimited international markets, freshwater fishes are expected to become a crucial source of animal protein, especially targeted for medium and lower income groups in developing countries, mainly in Asia (Dey *et al.*, 2004).

In 2004, Department of Fisheries Malaysia (DOF) has successfully produced a new carp hybrid using male lemon fin barb, *Hypsibarbus wetmorei* (locally known as Kerai kunyit) and female silver barb, *Barbonymus gonionotus* (locally known as Lampam Jawa) (Suharmili *et al.*, 2014). Lemon fin barb is one of the local fish with good market value (Mohamed, 2008). However, the supply of *Hypsibarbus wetmorei* is quite limited because it depends upon wild capture. Meanwhile, silver barb is an important carp species cultured in Indonesia, Malaysia, Thailand and Vietnam. It is a fast growing omnivorous carp that feeds on filamentous algae, submerged plants and some invertebrates (Mohanta *et al.*, 2008). This hybrid is called Kerai Lampam and sold at MYR18-25/kg.

### **1.1 Problem statement**

Recently, Kerai Lampan has become a new commercial species for aquaculture. This hybrid has good meat quality similar to lemon fin barb and at the same time with fast growing characteristic of silver barb. As a result, the demand of this hybrid increased and become new commercial aquaculture fish as it can breed in captivity. However, as a new commercial fish, many biological aspect of this species which include growth, survival and age of maturation have not been determined. In addition, the suitable size for breeding is not known.

## 1.2 Significant of study

Lack of information on the behavior of Kerai Lampam has spurred further study on this fish. Therefore, the objectives of this study were to observe the growth and survival of Kerai Lampam cultured in captivity from 2-9 month-old and to observe the gonadal development of Kerai Lampam through histological observation from 4-9 month-old.



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