

DETERMINATION OF TRIPLOID PRODUCTION USING COLD
SHOCK INDUCTION IN *Clarias gariepinus*

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DETERMINATION OF TRIPLOID PRODUCTION
USING COLD SHOCK INDUCTION
IN *C. gariepinus*

By

Muhamad Ainol Fikri Bin Othman

Research Report submitted in partial fulfillment of
the requirements for the degree of
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**FAKULTI AGROTEKNOLOGI DAN SAINS MAKANAN
UNIVERSITI MALAYSIA TERENGGANU**

**PENGAKUAN DAN PENGESAHAN LAPORAN
PROJEK ILMIAH I DAN II**

Adalah ini diakui dan disahkan bahawa laporan ilmiah bertajuk:

Determination of triploid production using cold shock induction in *Clarias gariepinus*

oleh Muhamad Ainol Fikri Bin Othman, No.Matrik UK13056 telah
diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan
kepada Jabatan Agroteknologi dan Sains Makanan sebagai memenuhi
sebahagian daripada keperluan memperolehi Ijazah Sarjana Muda
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DECLARATION

I hereby declare that the work in this thesis is my own except
for the quotations and summaries which have been dully
acknowledged.

Signature : 
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Abstract

This study was conducted to evaluate the differences between embryonic development and early growth of diploid and triploid induced African catfish (*Clarias gariepinus*). The objectives were to determine the embryonic development of triploid larvae and to determine triploid production using cold shock induction. The induction used in this study was cold shock induction which involved immersing fertilized eggs into 5°C and 10°C water for 45 minutes starting 5 minutes after fertilization. The hatching rate obtained was 95%, 32% and 30% for control replicate, 10°C and 5°C induction treatments respectively. However there was no significant difference between hatching rate of 10°C and 5°C induction. The triploid rate obtained was 80% and 90% for 5°C and 10°C inductions respectively. However there are no significant different of in term of triploid obtained for both inductions temperature regimes. There are no differences in term of embryonic development for all treatment. However, eggs from 5°C induction treatment hatched 2 hours earlier (17 hours AF) compare to control and 10°C inductions (19hours AF). Several deformities were observed for 5°C inductions larvae. The deformities observed might be due to the mechanical shock during embryo or larval development. In conclusion, the triploid production in *C. gariepinus* using cold shock induction yielded high triploid rate and this can be done either using 10°C or 5°C with the same level of probability to obtain triploid fish.

Abstrak

Kajian telah dijalankan untuk mengkaji perbezaan perkembangan embrio dan awal kitar hidup diantara Keli Afrika (*Clarias gariepinus*) diploid dan triploid. Objektif kajian ini adalah untuk menentukan perkembangan embrio didalam larva ikan triploid dan menentukan penghasilan ikan triploid melalui penggunaan aruhan suhu sejuk. Untuk mendapatkan telur triploid, aruhan suhu sejuk telah dijalankan pada 2 suhu berbeza iaitu 5°C dan 10°C selama 45 minit bermula 5 minit selepas persenyawaan berlaku. Kadar penetasan yang diperolehi adalah 95%, 32% dan 30% masing-masing bagi replika kawalan, aruhan suhu 10°C dan 5°C. Bagaimanapun tiada perbezaan yang signifikan bagi kadar penetasan antara aruhan suhu 10°C dan 5°C. Kadar triploid yang diperolehi adalah 80% dan 90% masing-masing bagi 5°C dan 10°C suhu aruhan. Bagaimanapun tiada perbezaan yang signifikan bagi dapatan triploid bagi kedua-dua suhu aruhan berkenaan. Tiada perbezaan yang diperhatikan pada perkembangan embrio bagi kesemua replikat kajian. Bagaimanapun, telur dari replikat aruhan 5°C menetas lebih awal 2 jam dari replikat kawalan dan aruhan 10°C. Terdapat kecacatan yang diperhatikan pada larva yang menetas dari telur yang dikenakan aruhan pada suhu 5°C. Kecacatan yang diperhatikan berkemungkinan besar disebabkan oleh kejutan mekanikal yang dikenakan. Konklusinya, penghasilan benih triploid *C. gariepinus* menggunakan aruhan suhu sejuk akan memperoleh hasil benih triploid yang tinggi dan aruhan suhu sejuk boleh dijalankan pada mana-mana suhu 5°C atau 10°C dengan aras kebarangkalian yang sama untuk mendapatkan benih triploid.