

**MORPHOLOGICAL DEVELOPMENT AND APPEARANCE OF THE EARLY
LIFE HISTORY (ELEUTHEROEMBRYO, LARVAE AND JUVENILE) IN
Cynotilapia afra (COBUE)**

by
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requirement for the degree of
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**FAKULTI AGROTEKNOLOGI DAN SAINS MAKANAN
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**PENGAKUAN DAN PENGESAHAN LAPORAN
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Adalah ini diakui dan disahkan bahawa laporan ilmiah bertajuk:

Morphological Development and Appearance of the Early Life History (Eleutheroembryo, Larvae and Juvenile) in *Cynotilapia afra* (Cobue) oleh Nor Shahidah Bt Abd Kohar, No.Matrik UK12965 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada **Jabatan Perikanan dan Akuakultur sebagai memenuhi sebahagian daripada keperluan memperoleh **Ijazah Sarjana Muda Sains Agroteknologi (Akuakultur)**, Fakulti Agroteknologi dan Sains Makanan, Universiti Malaysia Terengganu.**

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DECLARATION

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

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ABSTRACT

Studies on embryogenesis and larval ontogenesis have been important to the global knowledge of biology of species, primarily with relation to growth, feeding and behavioral aspects. With yolk as a food source, development of *Cynotilapia afra* takes place in the buccal pouch of the female until such time as juveniles are formed. The eleutheroembryo develops without metamorphic stages directly into a juvenile, forming advanced structures like fins, skeleton and pigments, at a time when large yolk sac is still present. Larvae were sampled during the incubation period, the samples were removed from the female's buccal pouch. Three organisms of *Cynotilapia afra* were preserved in 10% formalin buffered daily, during the first days and thereafter, at two days intervals. Body measurements and development have measured. At age 5 DAT, the beginning of differentiation of dorsal and anal fins were occurred. At age 11 DAT the yolk was substantially absorbed. *Cynotilapia afra* eleutheroembryos at the termination of endogenous nutrition and mouth incubation occur at 11 DAT. During the larval period, speed of growth is slow during the first weeks and accelerates exponentially ($R^2 = 0.9799$) from 19 DAT on, once postflexion and fin development have occurred.

ABSTRAK

Kajian tentang perkembangan embrio dan larvae sangat penting untuk mendedahkannya kepada pengetahuan yang sangat luas seperti ciri-ciri biologi yang terdapat pada sesuatu spesis, perkaitannya dengan pertumbuhan dan kelakuan. *Cynotilapia afra* merupakan spesis ikan cichlid dari jenis "mouthbrooder". Dengan adanya telur sebagai makanan, *Cynotilapia afra* akan berkembang dengan baik di dalam "buccal pouch" ibunya (induk betina) sehingga peringkat juvenil. Ketika kehadiran telur (yolk sac) lagi, perkembangan eleutheroembryo terus kepada juvenil berlaku dengan pembentukan beberapa struktur utama seperti sirip, tulang dan pigmen adalah tanpa melalui peringkat metamorfosis. Sampel larva akan di ambil sewaktu peringkat pengeraman di mana sampel akan dikeluarkan daripada "buccal pouch" induk betina. Tige ekor larva *Cynotilapia afra* akan di ambil setiap selang dua hari bermula pada hari pertama ia dipindahkan sehingga hari ke 25. Sampel diawet di dalam larutan formalin. Perkembangan dan ukuran setiap sampel diperhatikan dan di ambil. Pada hari ke lima, pembahagian sirip dorsal dan anal telah mula kelihatan. Pada hari ke 11, penyerapan telur semakin meningkat. Pertumbuhan didapati perlahan semasa peringkat larva terutamanya pada minggu pertama.