

THE EFFECT OF LIGHT INTENSITY AND LIGHT COLOR ON SURVIVAL
AND MORPHOLOGICAL CHANGES OF NILE TILAPIA
FRY

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**THE EFFECT OF LIGHT INTENSITY AND LIGHT COLOR ON SURVIVAL
AND MORPHOLOGICAL CHANGES OF NILE TILAPIA (*Oreochromis niloticus*)
FRY**

By

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the requirements for the degree of
Bachelor of Science (Marine Biology)**

**Department of Marine Science
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**DEPARTMENT OF MARINE SCIENCE
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UNIVERSITI MALAYSIA TERENGGANU**

**DECLARATION AND VERIFICATION REPORT
FINAL YEAR RESEARCH PROJECT**

It is hereby declared and verified that this research report entitled: The effect of light intensity and light color on survival and morphological changes of Nile Tilapia (*Oreochromis niloticus*) fry by Mohd Qusairi bin Muda, Matric No. UK1837 has been examined and all errors indentified have been corrected. This report is submitted to the Department of Marine Science as partial fulfillment towards obtaining the Degree of Bachelor of Science (Marine Biology), Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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LIST OF ABBREVIATIONS

°C	-	celcius
lx	-	lux
L	-	liter
ppt	-	part per thousand
%	-	percent
cm	-	centimeter
<	-	less than
>	-	more than
g	-	gram

ABSTRACT

It is well known that fish vision and spectrum perception are strongly related to each species natural habitat and ecology. Recent research data clearly indicate that light spectrum affects farmed fish stress response, physiological status, behaviour, and consequently growth performance. This study aimed to investigate the effects light intensities and colors on the survival and morphological changes of Nile tilapia (*Oreochromis niloticus*) fry. There were three types of treatment were conducted for 14 days. The first (T1) and second (T2) was performed by rearing Nile tilapia fry at light intensity of 150 lx and 300 lx respectively in different types of light colors which are white, red, and blue light. The third (T3) was rearing Nile tilapia fry under normal lighting condition as a control. The results showed that there were no significant differences between influences of light intensities and light colors toward survival rate and morphological changes (growth and deformities) of Nile tilapia fry. Based on the result, it is advisable to rear Nile tilapia fry under white light at either 150 lx or 300 lx under white light color for optimum survival rate. For optimum growth rate, it is advisable to rear Nile tilapia fry either under red light at 150 lx or under blue light at 300 lx. There are no deformities development been observed during experiment been conducted. Light spectrum and intensity effects on fish physiological condition require further research and it is clear that light spectrum and intensity should not be neglected when artificial light in indoor fish farming facilities is concerned.

KESAN KEAMATAN DAN WARNA CAHAYA TERHADAP KELANGSUNGAN HIDUP ANAK IKAN TILAPIA, *Oreochromis niloticus* DAN JUGA PERUBAHAN MORFOLOGI.

ABSTRAK

Telah diketahui umum bahawa penglihatan dan penerimaan spektrum ikan jelasnya berkaitan kepada habitat semulajadi sesuatu spesies dan ekologi. Penyelidikan sekarang jelas menunjukkan bahawa spektrum cahaya mempengaruhi tindak balas tekanan, keadaan fizikal, kelakuan dan kadar tumbesaran ikan. Kajian ini bertujuan untuk menyiasat kesan keamatan dan warna cahaya terhadap kelangsungan hidup dan perubahan morfologi anak ikan Nile tilapia (*Oreochromis niloticus*). Sebanyak tiga rawatan telah dijalankan selama 14 hari. Rawatan pertama (T1) dan kedua (T2) dijalankan dengan memerlihara anak ikan tilapia di bawah keamatan cahaya 150 lx dan 300 lx masing-masing di bawah warna cahaya yang berlainan iaitu putih (W), merah (R) dan biru (B) . Rawatan ketiga (T3) pula ialah memerlihara anak ikan tilapia di bawah keadaan biasa. Keputusan menunjukkan bahawa tiada perbezaan ketara tentang pengaruh keamatan dan warna cahaya terhadap kelangsungan hidup dan perubahan morfologi anak ikan tilapia. Berdasarkan keputusan, ia di nasihatkan untuk memelihara anak ikan tilapia di bawah cahaya putih di bawah keamatan cahaya samada 150 lx ataupun 300 lx untuk kadar kelangsungan hidup anak ikan tilapia yang terbaik. Pengaruh Untuk kadar pembesaran yang terbaik, ia di nasihatkan untuk memelihara anak ikan tilapia samada di bawah cahaya merah di bawah keamatan cahaya sebanyak 150 lx ataupun dibawah cahaya biru di bawah keamatan cahaya sebanyak 300 lx. Tiada kadar kecacatan yang

dilihat semasa eksperimen dijalankan. Pengaruh keamatan dan spektrum cahaya terhadap keadaan fisiologi memerlukan kajian yang lebih lanjut dan tampak jelas di mana keamatan dan spektrum cahaya tidak seharusnya diabaikan apabila kemudahan cahaya buatan di dalam peternakan ikan di usahakan.