

## INDONESIAN AQUACULTURE JOURNAL

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UDC 639.34

Ruby Vidia Kusumah, Dinar Tri Soelistyowati, Alimuddin, and Melta Rini Fahmi (Research Institute for Ornamental Fish Culture, Ministry of Marine Affairs and Fisheries)

Variations of red color coverage of cultured neon tetra (*Paracheirodon innesi*) for breeding improvement strategies

Indonesian Aquaculture Journal, 16 (1), 2021, 1-11

Red color coverage (RCC) is a commercial trait developed and refined to improve the appearance of many ornamental fish commodities. In neon tetra, the status of variation of RCC is not yet investigated or reported. This study aimed to analyze the RCC variation of cultured neon tetra as a basis for breeding strategies. A total of 900 neon tetras (standard length, SL, of  $2.29 \pm 0.16$  cm) were collected from Bojongsari, Curug, and Pondok Petir fish farms located in Depok Districts, West Java. All fish were relocated and reared in a fish farm specialized in culturing neon tetra for two weeks using nine aquariums with photoperiod set up of 12 hours bright and 12 hours dark. The RCC traits were determined according to the percentages of RCC length (%LRCC), RCC width (%WRCC), and RCC area (%ARCC) and quantified using the digital image method. The result showed that the RCC varied by sex, size, and original location ( $P < 0.05$ ) in a low coefficient of variation (1.89%-11.41%). The RCC values in the male group were higher than that of females based on %LRCC and %ARCC parameters ( $P < 0.05$ ). Males had the highest %LRCC at size LXL, which was correlated with SL ( $r = 0.25$ ,  $P < 0.1$ ), of females at M size. The %LRCC values of the neon tetra population from the Bojongsari farm were higher than those from the other locations. Based on these findings, breeding strategies of the RCC traits should consider sex, size, and population (farm location) variations. Specifically for neon tetra, this strategy should be based on selecting the SL or %LRCC parameter of M for females and LXL for males.

KEYWORDS: aquaculture; digital image; *Paracheirodon innesi*; red color coverage; variation

UDC 639.31

Yogi Himawan, Alimuddin, Kukuh Normala, Imron, and Joni Haryadi (Research Institute for Fish Breeding)

Biochemical responses and genetic expressions of synthetic common carp population exposed to high-ammonia rearing environment

Indonesian Aquaculture Journal, 16 (1), 2021, 13-19

Carp is one of the leading freshwater aquaculture commodities in Indonesia. Further improvement of carp strains by the Research Institute for Fish Breeding (RIFB), Sukamandi, Indonesia, has produced a synthetic F2 carp. The strain is assembled from different strains of carps and has shown better growth and health characteristics. Considering that high environmental ammonia (HEA) has affected most carp grow-out systems, this study aimed to determine the performance of the synthetic carp populations in a high ammonia rearing environment. The treatments were rearing media of the synthetic carp seed populations added with and without (control) 200 mg/L  $\text{NH}_4\text{Cl}$  arranged in three replicates. A total of 30 fish seeds/aquarium, weighed 10-15 g/fish, was used in the study. Dissolved oxygen levels were maintained above 2 mg/L using aeration. This study shows that higher tolerant carp populations had red blood cells of  $232.66 \pm 17.24$  cells/mL, indicating a direct effect of high ammonia on red blood cell count ( $p < 0.05$ ). Cortisol levels of  $80.90 \pm 6.35$  ng/mL in resistant carp indicate significant differences ( $p < 0.05$ ). The relative expressions of the HSP70 gene in the liver (Log10) ranged between 0.72 and 2.80. The values demonstrate that high ammonia-resistant synthetic carp have a higher relative expression ratio of the HSP70 gene than the less resistant group. This research concluded that the populations of synthetic F2 carp showed a degree of resistance against high-ammonia rearing conditions. When it is ready for aquaculture, this synthetic carp strain could be farmed in high density using intensive systems in HEA-affected artificial lakes and reservoir

KEYWORDS: synthetic; high ammonia; red blood cell; cortisol; HSP70 gene

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Md. Imtiaz Rahman, Md. Sadiqul Islam, Md. Saddam Hossain, Md. Ripon Ali, Bipresh Das, Mohammad Amzad Hossain, and Mohammed Mahbub (Department of Fish Biology and Genetics, Sylhet Agricultural University)

Induced spawning and larval development of vietnamese koi, *Anabas testudineus* (Bloch, 1792) using salmon gonadotropin releasing hormone analogue (S-GnRHA)

Indonesian Aquaculture Journal, 16 (1), 2021, 21-27

The present research work has been carried out to obtain evidence on breeding and embryonic growth of *A. testudineus* by using S-GnRHa. Fish were injected with three different doses (0.25, 0.5, and 1.0 mL/kg body weight) of synthetic hormone S-GnRHa each with three replications, where male brood fish received half of the doses of female. The fecundity of *A. testudineus* was ranged from 47,227 to 77,561 during the study period and except control group all the hormone received group ovulated within 12 hours of hormone injection. Among all groups, the highest fertilization rate (89.33%), highest hatching rate (79.5%) as well as highest survival rate (67.0%) was obtained at 0.5 mL/kg body weight hormone dose recipient group. The fertilized egg's diameter was recorded as  $77.59 \pm 3.50 \mu\text{m}$ . The first cleavage had appeared within 18-25 min of fertilization and eventually the morula, blastula, and gastrula stages were observed at 3:10 h, 4 h, and 5:30 h, respectively after fertilization. Larvae with distinguished head, body form and tail appendage spotted between 17-22 h and the larvae started hatching at 19 h after fertilization. The average length of larvae accounted as  $105.41 \pm 3.73 \mu\text{m}$ . The findings of present study revealed that 0.5 mL/kg S-GnRHa could be efficient dose for successful induced breeding of *A. testudineus*.

KEYWORDS: S-GnRHa; induced breeding; *Anabas testudineus*; larval development

UDC 639.34

Fajar Maulana, Dinar Tri Soelistyowati, dan Muhammad Fadlan Furqo (IPB University)

Spawning of black ghost knifefish, *Apteronotus albifrons* with different sex ratios

Indonesian Aquaculture Journal, 16 (1), 2021, 29-34

Black ghost knifefish, *Apteronotus albifrons*, is a South America-introduced ornamental fish species that has been widely cultivated in Indonesia. Some farmers breed this fish with different sex ratios, but the optimum sex ratio remains unclear. This study aimed to evaluate the spawning behavior and reproductive performance of black ghost knifefish with different sex ratios. The treatments in this study were arranged in a completely randomized design consisting of different sex ratios between males and females, namely: A (one male : three females), B (two males : three females), and C (three males : three females). Each treatment was done in triplicate. The broodstock were maintained in an aquarium (80 cm x 40 cm x 40 cm) and fed with bloodworm twice a day. The water was changed every day as much as 60% of the total volume. During the experiment, the parameters of spawning behavior, number of fish spawning, number of eggs, fertilization rate, hatching rate, and daily spawning frequencies were observed. The observation was done for seven days. The study results showed that black ghost knifefish spawned at night (11 pm - 2 am). The mating and spawning occurred between one male and one female. Competition between males was observed in the treatments indicated by aggressive movements of a male toward the others, such as sudden approaching, chasing, and driving away the others. Fish in treatment-B spawned consistently from day-1 to day-5. Fish in treatment-A spawned from day-2 to day-4, while fish in treatment-C spawned only on day-7. The reproductive performance parameters showed no significant difference in all treatments except the hatching rate parameter of treatment-B. The study concludes that better reproductive performance of black ghost knifefish, *A. albifrons* can be achieved with a spawning ratio of two males and three females. Further research on individual and mass spawning methods with the best spawning ratio of the fish is required.

KEYWORDS: black ghost knifefish; sex ratio; spawning behavior; mating system

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Asda Laining, Agus Nawang, Andi Sahrijanna, Muhammad Hafid Masruri, and Rachman Syah (Research Institute for Coastal Aquaculture and Fisheries Extension)

Dietary organic mineral influences the growth, feed utilization, and vertebral mineral content of wild golden rabbitfish, *Siganus guttatus*

Indonesian Aquaculture Journal, 16 (1), 2021, 35-42

The positive effect of organic mineral as a dietary mineral source in aquafeed has been recently reported on several species. Nevertheless, the influence of organic minerals on rabbitfish has not yet been determined. The purpose of the present study was to evaluate the effects of different doses of organic mineral on growth and survival, and mineral content in vertebrae of golden rabbitfish, *Siganus guttatus*. Three diets were formulated containing 0.5%, 1.0%, and 2.0% organic material (OM). A control diet (OM0) did not contain OM. Instead, it was supplemented with an inorganic mineral mixture at a level of 1%. Three hundred fish were randomly selected and distributed in 12 cages to accommodate the four treatments with triplicates. The stocking density was 20 fish per cage. The initial body weight of fish used was  $39.2 \pm 0.3$  g. Fish were fed the test diets twice a day for 150 days. A significant ( $P < 0.05$ ) cubic effect of the treatments was detected on all dependent parameters analysis, excluding feed intake. The influence of dietary OM was not significant for feed intake, indicating that dietary OM did not negatively affect the appetite of rabbitfish. Mineral (Ca, Mg, Zn) content in the vertebrae was significantly improved when dietary OM was included in the diet up to 1% but decreased at the highest inclusion level of 2%. The optimum level of dietary OM to gain the maximum growth rate of rabbitfish was 0.49% as the reflection of the breakpoint of two regressions fitted on specific growth rate (SGR). It is concluded that dietary OM level significantly affected the growth and vertebral mineral content of golden rabbitfish. The study increases our knowledge of the benefit of utilizing dietary OM in the fish diet.

KEYWORDS: organic mineral; growth; vertebral mineral content; rabbitfish

UDC 639.31

Wahyulia Cahyanti, Nunak Nafiqoh, dan Otong Zenal Arifin (Research Institute of Freshwater Aquaculture and Fisheries Extensions)

Stress responses of three species of cyprinid: common carp (*Cyprinus Carpio*), bonylip barb (*Osteochilus hasselti*), and torsoro (*Tor Soro*) subjected to oxygen depletion

Indonesian Aquaculture Journal, 16 (1), 2021, 43-50

Fish in stressed conditions will show symptoms of a decreased physiological function. These symptoms include changes in the respiration system (gills, breathing frequency) and blood hemoglobin. Cyprinid fish are active fish that require high oxygen levels. In a minimum oxygen condition, cyprinid fish are easy to get stressed. Despite the extensive literature on cyprinid biology, comparison of declined physiological functions due to oxygen depletion in cyprinid are few and far between. The purpose of this study was to determine the physiological reactions and organ responses of three species of Cyprinidae, common carp (*Cyprinus carpio*), nilem carp (*Osteochilus hasselti*), and Torsoro carp (*Tor soro*) challenged to oxygen depletion. The study was conducted using 18 fishes for each species with an average body weight of  $48.11 \pm 4.24$  g. Oxygen depletion challenge was done by placing the test fish in closed and non-aerated aquaria (40 cm x 20 cm x 20 cm). The dissolved oxygen level in each aquarium was measured every 30 minutes. Fish breathing frequency was calculated by the frequencies of mouth movement every 30 minutes. Histological examination of gills and blood was taken from healthy fish (at the beginning of treatment) and at  $LC_{50}$  (lethal concentration). The results showed that oxygen depletion reduced blood hemoglobin levels down to  $5.1 \pm 1.4$  gram%,  $3.3 \pm 1.15$  gram%, and  $1.5 \pm 0.71$  gram% for goldfish, nilem, and torsoro, respectively. The respiratory rate varied from normal to depleted conditions. When depletion occurred, the respiratory rate increased and decreased again when the fish started to get weak. In normal conditions, the breathing frequency of goldfish was 60 beats/minute, nilem was  $108 \pm 20.8$  beats/minute, and *Tor soro* was  $144 \pm 31.7$  beats/minute. The highest respiration frequency occurred in *tor soro* fish in the 150th minute with a value of  $216 \pm 0.0$  beats/minute. The fastest mortality at  $LC_{50}$  occurred in torsoro at  $245.00 \pm 17.32$  minutes.

KEYWORDS: Cyprinidae; oxygen depletion; stress response

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Ofan Bosman, Tri Edhi Budhi Soesilo, and Sinung Rahardjo (School of Environmental Science, Universitas Indonesia)

Pollution index and economic value of vannamei shrimp (*Litopenaeus vannamei*) farming in Indonesia

Indonesian Aquaculture Journal, 16 (1), 2021, 51-60

Shrimp farming has contributed a large share in Indonesia's aquaculture portfolio for at least a decade, and a national plan to increase shrimp production by 250% has been recently laid out. However, boosting shrimp productions could lead to unintended consequences in environmental and socio-economic negative impacts. The rapid development of vannamei farming in Java has increased coastline land clearings and demands of fertilizers, feeds, and chemicals to sustain the farming activities. Such pressures will eventually lead to a reduced environmental capacity and the farming efficiency itself. This study aimed to study the environmental impacts and business performance of intensive shrimp farming in Indonesia. The study was conducted in Aquaculture Business Center (ABC) in Karawang for four months, from July to October 2020. *In-situ* and *ex-situ* measurements of water quality parameters were done at six sampling stations directly post-harvest water discharge. The measured parameters consisted of temperature, pH, dissolved oxygen, ammonia (NH<sub>3</sub>), nitrite (NO<sub>2</sub>), nitrate (NO<sub>3</sub>), phosphate (PO<sub>4</sub>), alkalinity, and salinity. Pollution Index (PI) was used as the primary method to determine the environmental impacts of the shrimp farming. The R/C Ratio was used to analyze the business performance of the company. The results showed that the water quality index in the ABC area was categorized as lightly polluted in station 1 (PIj 4.52) and station 5 (PIj 4.37), moderately polluted in station 2 (PIj 6.24), station 3 (PIj 6.72), and station 4 (PIj 6.13) and heavily polluted in station 6 (PIj 111.06). The determined R/C ratio was 1.10, meaning that the shrimp farming is classified as economically profitable. Although the shrimp farming's economic performance value is very good, the water conditions affected by waste from the shrimp pond culture will reduce the R/C ratio in the future if not properly managed.

KEYWORDS: pollution index; water quality; vannamei; R/C ratio; environment

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# SEND INSTRUCTIONS FOR WRITING AND PUBLISHING ARTICLES OF INDONESIAN AQUACULTURE JOURNAL 2016 (12pt Bold)

I Nyoman Adiasmara Giri<sup>\*)#</sup>, Ketut Sugama<sup>\*)</sup>, Alimuddin<sup>\*\*\*</sup>), and Anang Hari Kristanto<sup>\*\*\*\*</sup>)

\*) Research and Development Institute for Mariculture, Gondol

\*\*) Center for Fisheries Research and Development, Jakarta

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**KEYWORDS:** Author guidelines; research journal; aquaculture; article template

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**CONCLUSION:** The conclusion describes the response of hypotheses and / or research purposes. Conclusions not contain looping of results and discussion, but rather to a summary of the research results.

Table 1. Response to selection and final mean body weight of the third generation compared to the control population of the African catfish *Clarias gariepinus* at the end of larval rearing, nursery and grow-out phases

Phases	Periods (days)	Final mean body weight (g)		Response to selection	
		Third generation	Control	Gram (g)	Percentage (%)
Larval rearing	25	0.19 ± 0.10	0.19 ± 0.07	-	-
Nursery	30	6.12 ± 2.93	5.80 ± 3.50	-	-
Grow-out	60	198.67 ± 82.82	165.22 ± 71.09	33.45	20.24

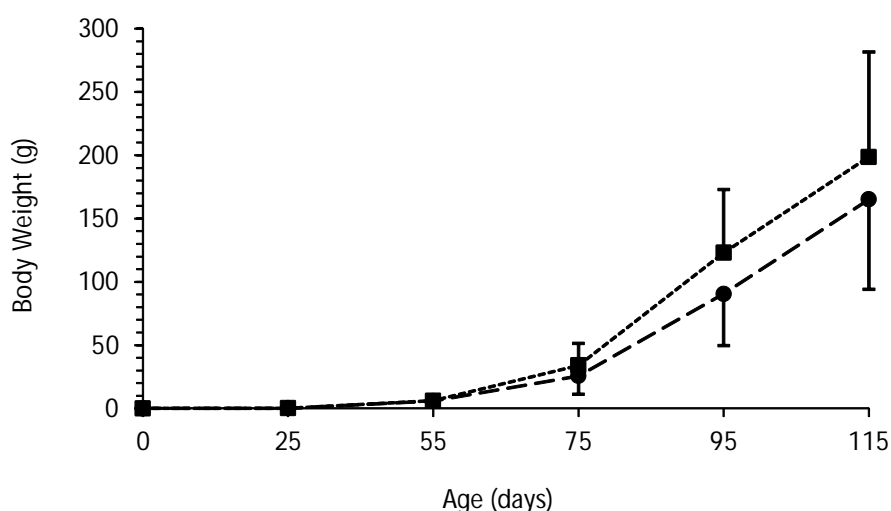


Figure 1. Growth performances based on body weight during 25 days of larval rearing phase, 30 days of nursery phase and 60 days of grow-out phase (based on samplings of 2% populations) of the third generation (■) and control population (●) of the African catfish (*Clarias gariepinus*) genetic improvement program held at Research Institute for Fish Breeding, Sukamandi. Vertical lines represent its each standard deviation



**ACKNOWLEDGEMENTS:** thanks mainly devoted to research funders. Acknowledgements can also be delivered to the parties that support the implementation of the research and writing of the manuscript.

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Each equation is written centered and numbered columns are written in parentheses and placed at the end of the right margin. Equations should be written using Equation Editor in MS Word or Open Office (Primack, 1983).

$$RPS = \left( 1 - \frac{\% \text{ fish mortality of vaccinated}}{\% \text{ Fish mortality of control}} \right) \times 100$$

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## 11. References

- Bekker, J.G., Craig, I.K., and Pistorius, P.C. (1999). Modeling and Simulation of Arc Furnace Process. *ISIJ International*, 39 (1), 23-32.
- Bezuidenhout, J.J., Eksteen, J.J., & Bradshaw, S.M. (2009). Computational fluid dynamic modeling of an electric furnace is used in the smelting of con-

centrates containing PGM. *Minerals Engineering*, 22 (11), 995-1006.

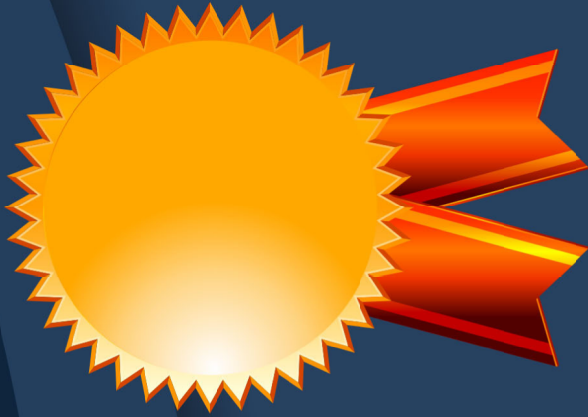
- Bhaktavatsalam, A.K. & Choudhury, R. (1995). Specific Energy Consumption in the Steel Industry. *Energy*, 20 (12), 1247-1250.
- Camdali, U. & Tunc, M. (2006). Steady State Heat Transfer of Ladle Furnace Steel During Production Process. *Journal of Iron and Steel Research, International*, 13 (3), 18-20.
- Fridman, A. (2008). *Plasma Chemistry* (p. 978). Cambridge: Cambridge University Press.
- Hovmand, S. (1995). Fluidized Bed Drying. In Mujumdar, USA (Ed.) *Handbook of Industrial Drying* (p. 195-248). 2nd Ed. New York. Marcel Dekker.
- Istadi, I. (2006). Development of A Hybrid Artificial Neural Networks - Genetic Algorithm for Modeling and Optimization of Dielectric-Barrier Discharge Plasma Reactor. PhD Thesis. Universiti Teknologi Malaysia.
- Primack, H.S. (1983). Method of Stabilizing polyvalent Metal Solutions. US Patent No. 4,373,104.
- Roeva, O. (2012). Real-World Applications of Genetic Algorithm. In International Conference on Chemical and Materials Engineering (p. 2530). Semarang, Indonesia: Department of Chemical Engineering, Diponegoro University.
- Wang, Z., Wang, N.H., & Li, T. (2011). Computational analysis of a twin-electrode DC submerged arc furnace for the production of crystal MgO. *Journal of Materials Processing Technology*, 211 (3), 388-395.

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