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Thamara Ratnadilla, Dinamella Wahjuningrum, and Widanarni (Department of Aquaculture, Faculty of Fisheries and Marine Science, IPB University)

Moringa leaf simplicia enhanced health status and immune response of tilapia against *Edwardsiella tarda* infection

Indonesian Aquaculture Journal, 20(2), 2025, 107-122

Intensive fish aquaculture increases the risk of diseases like Edwardsiellosis caused by Edwardsiella tarda, which can lead to 30–50% mortality rates. While antibiotics have been used for disease control, excessive use can result in antibiotic residue and bacterial resistance. Moringa leaves (Moringa oleifera) are a promising herbal ingredient containing active compounds like glucomoringin, moringin, flavonoids, tannins, saponins, alkaloids, and phenols, which can be used in aquaculture. This study aims to evaluate the effect of administering different doses of moringa leaf simplicia (MOLS) through feed for the prevention of E. tarda bacterial infection in tilapia. The research was conducted in two stages, namely in vitro and in vivo testing. The first stage was an in vitro test to determine the dose of moringa leaf extract that can inhibit the growth of E. tarda. The second stage was an in vivo test to evaluate the effect of feeding MOLS on growth performance, health status and immune response, and resistance of tilapia to E. tarda infection. In vivo tests were namely MOLS 12.5 g kg⁻¹ (M12.5), 25 g kg⁻¹ (M25), 50 g kg⁻¹ (M50), positive control (K+) and negative control (K-). The test fish used were tilapia fish measuring 7.77 ± 0.06 g which were kept in 15 aquariums with density of 10 fish per aquarium for 30 days. Fish were challenged on the 31st day with E. tarda cell suspension 10⁶ CFU mL⁻¹ which corresponds of the LD50 value-the bacterial dose that cause 50% mortality in the tested fish population and then the fish were maintained for 7 days. The results showed that increasing the addition of MOLS for 30 resulted in significant improvements (P<0.05) in growth of tilapia with control. The highest abundance of lactic acid bacteria was found in the M12.5 treatment, a significant difference (P<0.05) compared to the control treatment. MOLS also significantly improved the health status and immune response of tilapia (P<0.05), and suppressed the population of E. tarda in kidney and liver organs. Kidney histopathology showed normal to lightly damage in the MOLS treatment observed significantly lower (P<0.05) than the K+ treatment with lightly damage. Liver histopathology also showed normal to lightly damage in MOLS treatment observed significantly lower (P<0.05) than K+ with medium damage. M12.5 treatment showed the highest resistance significantly different (P<0.05) compared to K+ treatment. MOLS was able to improve the health status and immune response, as well as the resistance of tilapia to E. tarda infection with the best dose in feed with the addition of 12.5 g kg⁻¹ MOLS.

KEYWORDS: *Edwardsiella tarda*; immunostimulant; moringa; simplicia; tilapia

Yogi Himawan, Didik Ariyanto, Suharyanto Suharyanto, and Flandrianto Sih Palimirmo (Research Center for Fishery, National Research and Innovation Agency)

Optimization of mustika common carp culture to increase fish farmers' income in Bangkinang, Kampar: a productivity and economic analysis

Indonesian Aquaculture Journal, 20(2), 2025, 123-132

A trial of common carp culture using a selected population was conducted in Bangkinang, Kampar Regency, Riau Province. This research aims to develop the socio-economic aspects of rural society, especially among common carp farmers in this area. The main material used was the Mustika common carp, a selected common carp population renowned for its disease resistance and fast growth. A local common carp population obtained from local hatcheries was used for comparison. The individual size of fish stocked was 10-15 grams. A total of six units of static net cages in the Kampar River and six units of floating net cages in the Kotopanjang Reservoir were used for triplicate culturing fish. The trial culture was conducted for 12 weeks. The results showed that Mustika common carp performed significantly better than local common carp, as indicated by high survival rates, growth rates, and individual harvested weights. The harvested yield, FCR, and productivity of Mustika common carp were also better than those of the local common carp. From an economic perspective, the used of Mustika common carp in both trial sites yielded higher margins and benefit-cost (B/C) ratios, faster in term of returns on investment (RoI) and payback periods (PP), and potentially increasing fish production by approximately 4.45% annually than local common carp. These results suggest that cultivating the Mustika common carp was more feasible for farmers in the area. The study highlights the need for high-quality fish seeds and advocates for collaboration between the government and private sectors to enhance common carp farming and improve the socio-economic levels of rural communities.

KEYWORDS: Aquaculture; *Cyprinus carpio*; economic analysis; net cages; productivity

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Shofii Amaliah Putri, Sukenda, Munti Yuhana, and Kukuh Nirmala (Department of Aquaculture, Faculty of Fisheries and Marine Science, IPB University)

Effect of negative redox potential of dry sediment on the infectivity of *Vibrio parahaemolyticus*, growth and health status of pacific whiteleg shrimp

Indonesian Aquaculture Journal, 20(2), 2025, 133-144

Sediment serves as a site for the accumulation of aquaculture waste. Oxidation-Reduction Potential (ORP) is an index indicating anaerobic conditions. A combination of host, pathogen, and suboptimal environmental quality can lead to disease outbreaks. One such disease is Acute Hepatopancreatic Necrosis Disease (AHPND), caused by Vibrio parahaemolyticus. This study was aimed to analyse the impact of sediment drying on infectivity of V. parahaemolyticus growth and health status of Pacific whiteleg shrimp. The sediment ORP used at the initial study was -37 mV. The sediment was dried for 120 hours at a temperature of 40.75 ± 2.73 °C. A total of 15 shrimp/aquarium with an average body weight of 2.35 ± 0.22 g/individual were reared in aquarium sized 20x25x30 cm³ containing dried and undried sediment for 120 hours, then contaminated with 105 CFU/mL V. parahaemolyticus through immersion from the start of rearing until 20 days later. The results showed that sediment drying was able to reduce bacterial abundance and increase ORP sediment. The longer duration of cultivation, the more the sediment ORP decreased. Sediment ORP decreased with increasing shrimp farming duration. The highest bacterial abundance in the sediment on third phase of study was observed in the positive control treatment on D + 10 (2.02 ± 0.39)x10⁴ CFU/g, then it decreased until the end. Meanwhile, bacterial abundance in water and hepatopancreas decreased until the end of the study. Survival rates, immune responses, and growth parameters of shrimp with sediment drying were higher than the positive control ($p < 0.05$) but not significantly different from the negative control. The histopathology of shrimp hepatopancreas profile in the sediment drying treatment was better compared to the positive control.

KEYWORDS: *Litopenaeus vannamei*, redox potential, sediment drying, *V. parahaemolyticus*

Waryanto, Joga Dharma Setiawan, Mochammad Arianto, Bakti Berlyanto Sedayu, Ninik Umi Hartanti, Suyono, Karina Farkha Dina, Heru Kurniawan Alamsyah, Hozin Aziz, Imam Taukhid, Supriyanto, Riza Zulkarnain, and Zaenal Arifin Siregar (Research Center for Appropriate Technology, Research Organization for Agriculture and Food, National Research and Innovation Agency, Subang, Indonesia)

Administration of *Curcuma* spp. extract to control *Aeromonas hydrophila* infection in striped catfish (*Pangasianodon hypophthalmus*)

Indonesian Aquaculture Journal, 20(2), 2025, 145-156

One way to help the feeding process vannamei shrimp in ponds that have cloudy surface using constructed with a size of 50 × 50 × 18 cm with a water height in the pond of 7 cm from bottom, where the data in the form of images was obtained from data collection 25 times using a camera is placed at a height of 52 cm above the water surface. The pond's entire surface was captured with one click of the camera. The number of vannamei shrimp used in this study was 7. The method used for data processing is thresholding, in which the threshold value is generated using a histogram-based technique from the image data. This method is employed to distinguish shrimp from non-shrimp regions in the image. From this study, a vannamei shrimp detection technique was developed, producing results in the form of a script that distinguishes vannamei shrimp objects from non-vannamei shrimp. The detection accuracy achieved using the thresholding method in this study is 94.28%. The positions of the shrimp were produced in the form of coordinates as a step to success according to the objectives of this study, which were able to detect positions, in order to help facilitate the process of feeding in ponds. This detection technique could be developed for application on full-scale ponds, utilizing cameras mounted on drones as a tool for detecting vannamei shrimp positions in cloudy pond water. This technology may be adapted to allow targeted feeding of shrimp in ponds, thus maximizing food consumption and minimizing food wastage.

KEYWORDS: Cloudy pond water; Miniature Pond; Image processing; Camera; Vannamei shrimp

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Morfow Nkeze Paul, Nor Azman Kasan, Benedicta Oshuware Mbu Oben, and Friday Elijah Osho (Higher Institution Centre of Excellent (HICoE), Institute of Tropical Aquaculture and Fisheries, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia)

A review of technological developments in shrimp aquaculture production

Indonesian Aquaculture Journal, 20(2), 2025, 157-172

This review examines breakthrough technological developments in shrimp aquaculture, emphasizing key advances, remaining barriers, and policy implications for sustainable sector growth. Major technological innovations include biotechnology-driven improvements such as genetic selection, MAS and emerging CRISPR applications for disease-resistant stocks. AI-based monitoring and automation systems that optimize feeding and environmental control in real time; microbial approaches including probiotics and biofloc technology that enhance water quality and pond stability. Novel feeds incorporating insect, microbial and other alternative proteins to reduce dependence on fishmeal. These advances collectively improve productivity, animal health and environmental performance. However, adoption is hindered by high capital costs, technical complexity and limited farmer training. More so, uneven access to digital and genomic tools, particularly among small-scale producers. Addressing these barriers requires supportive policies that promote inclusive technology transfer, investment incentives, capacity building and regulatory frameworks for safe use of biotechnologies and data-driven systems. Overall, the review highlights how integrated biotechnological and AI-enabled innovations can transform shrimp aquaculture, provided that enabling policies ensure equitable, responsible and sustainable implementation.

KEYWORDS: Advanced technology; bioflocs; environmental sustainability; production systems; shrimp aquaculture

Nur Istiqamah, Magdalena Litaay, and Ambeng (Biology Postgraduate Program, Faculty of Mathematics and Natural Sciences, Hasanuddin University, Makassar. Indonesia)

The relationship of the water parameter to the growth and the carrageenan quality of *Kappaphycus alvarezii* (doty) doty ex P.C. Silva (1996) in Belopa, Luwu Regency, Indonesia

Indonesian Aquaculture Journal, 20(2), 2025, 173-183

*The research aims to determine the relationship of water quality parameters to the growth and carrageenan quality of red algae *Kappaphycus alvarezii*. This research was conducted in July November 2022 in the waters of Belopa sub-district, South Sulawesi, Indonesia. Water quality parameters measured were temperature, pH, salinity, brightness, depth, current velocity, dissolved oxygen, nitrate, and phosphate. The cultivation was conducted by longline method. There were 3 stations and each station had 3 stretched ropes with a length of 5 m as replicates. The growth was calculated by measuring the specific growth rate and the absolute weight growth. The quality of carrageenan was tested by yield, water content, and ash content. Water quality and growth data were collected every 10 days for 40 days. The effect of growth and quality of carrageenan on each location was analyzed through ANOVA and Kruskal Wallis tests. The relationship between parameters was analyzed through coefficient correlation tests (Pearson Simple Linear Correlation). The determination of characteristic parameters at each station was applied through the principal component analysis test. The results showed that the yield of carrageenan was impacted by phosphate. The water affected by nitrate and brightness. Ash content affected by temperature, pH, and current velocity. Different location did not significantly affect the growth and quality of carrageenan.*

KEYWORDS: *Kappaphycus alvarezii*; growth, water quality, red algae; seaweed

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Firew Admasu, Mulugeta Wakjira, Tokuma Negisho Bayissa, and Ketema Bacha (Aquaculture and Fisheries Management, Department of Biology, College of Natural Sciences, Jimma University, Jimma, Ethiopia)

Impact of protein and probiotic supplementation on immunity and survival of *Clarias gariepinus* under pathogen challenge in aquaculture

Indonesian Aquaculture Journal, 20(2), 2025, 185-195

Bacterial infections, particularly those caused by Pseudomonas aeruginosa, pose a threat to aquaculture and lead to economic losses in African catfish (Clarias gariepinus). This study evaluates the effects of dietary protein and probiotic supplementation on fish health, growth performance, and survival following P. aeruginosa infection, using both in vitro and in vivo approaches. The in vitro assays determined the infective dose of P. aeruginosa and its interactions with probiotics. At the same time, in vivo trials assessed survival, behavioral responses, feed utilization efficiency, and pathological changes over 72 hours. Furthermore, fish were fed varying protein levels (35%, 40%, and 45%) and probiotic concentrations (1:2:3 ratio) for two months before being challenged with bacteria. Higher protein (40-45%) and probiotic supplementation (2-3 mL) significantly improved survival rates (up to 83.33%), reduced weight loss, and mitigated organ damage as opposed to groups with lower supplementation (50% survival), though lower than the uninfected controls (100% survival). The improved survival and reduced pathological damage in probiotic-supplemented fish suggest a potential enhancement of immune defense mechanisms and overall physiological resilience. Probiotics have been reported to modulate immune responses by promoting beneficial microbiota, competing with pathogens, and supporting host immunity, which may contribute to the observed protective effects. Additionally, probiotic-fed groups exhibited improved water quality with lower accumulation of nitrogenous waste in infected tanks. These findings suggest that protein- and probiotic-enriched diets enhance disease resilience, feed efficiency, and water quality in aquaculture, supporting sustainable fish production through nutritional and health improvement. Future research is recommended to investigate immune-related biomarkers to better understand the immune-modulatory effects of these dietary interventions.

KEYWORDS: African catfish; aquaculture; immunity enhancement; probiotic and protein supplementation; *Pseudomonas aeruginosa*

Aslia, Tatag Budiardi, Yani Hadiroseyani, and Iis Diatin (Department of Aquaculture, IPB University, Bogor, Indonesia)

Production performance and financial analysis of glass eel (*Anguilla bicolor*) nursery at different stocking densities using ras

Indonesian Aquaculture Journal, 20(2), 2025, 197-208

Eel aquaculture remains dependent on wild-caught glass eels, whose supply fluctuates seasonally and peaks during the rainy season. Improving nursery efficiency through optimized stocking density is therefore essential. This study evaluated the effects of three stocking densities (1, 2, and 3 g L⁻¹) on the production performance and financial feasibility of glass eel (Anguilla spp.) nursery operations in recirculating aquaculture systems (RAS). Stocking density significantly affected survival, biomass yield, and profitability ($p < 0.05$). The highest density (3 g L⁻¹) resulted in the lowest survival rate ($35.69 \pm 3.70\%$), which was significantly lower than both 1 g L⁻¹ and 2 g L⁻¹, yet produced the greatest biomass (11.42 ± 0.57 g L⁻¹). Financial analysis showed that all treatments were viable, with 3 g L⁻¹ yielding the highest profit (IDR 378,035,622 \pm 45,089,672). Despite reduced survival, profitability remained relatively stable across treatments, indicating that biomass gain compensated for mortality-related losses. These findings demonstrate that a stocking density of 3 g L⁻¹ provides the most advantageous balance between production output and economic return for glass eel nursery operations in RAS.

KEYWORDS: Glass eel nursery; stocking density optimization; recirculating aquaculture system (RAS); aquaculture economics; production performance

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Ni Wayan Widya Astuti, Ananto Setiadi, Gunawan, Jhon Harianto Hutapea, Ahmad Muzaki, and Haryanti (Research Centre for Marine Aquaculture, National Research and Innovation Agency)

Characterization of endogenous bacteria as potential probiotics in larval rearing of yellowfin tuna (*Thunnus albacares*)

Indonesian Aquaculture Journal, 20(2), 2025, 209-220

The main objective of this study was to determine the profile of endogenous intestinal bacteria of yellowfin tuna, Thunnus albacares that can function as potential probiotics in the digestive system and used for the maintenance of yellowfin tuna larvae. Wild yellowfin tuna, T. albacares was collected from the waters of Gerokgak, Buleleng, North Bali, Indonesia. Intestinal bacteria were isolated, identified, characterized, and followed by enzymatic hydrolysis activity tests, antagonistic tests and pathogenicity tests to select candidate bacteria as probiotics. The results of the enzymatic hydrolysis activity test showed that there were 4 isolates of candidate probiotic bacteria that were active in enzymatic synthesis for amylase, lipase, casease, lecithinase, gelatinase. Identification through Sanger sequencing resulted in 4 potential bacterial isolates as probiotics, namely Bacillus subtilis strain T-A1, Bacillus amyloliquefaciens strain T-N2, Bacillus subtilis strain T-O4, and Paraclostridium bifermentans strain T-O6. These four bacteria were not antagonistic between varieties and were not pathogenic in Tuna fish. Yellowfin tuna fed probiotic supplements grew faster (5.5002 ± 0.2 mm) than the control (4.9002 ± 0.4 mm). The success of yellowfin tuna seed production is expected to be sustainable and its implementation in the private sector for aquaculture purposes.

KEYWORDS: Endogenous bacteria; probiotics; yellowfin tuna; *Thunnus albacares*

Imam Tri Wahyudi, Dedi Jusadi, Mia Setiawati, Julie Ekasari, Muhammad Agus Suprayudi, Mohamad Iqbal Kurniawinata, and Ainulyakin Hasan Imlani (Study Program of Technology and Management of Applied Aquaculture, College of Vocational Studies, IPB University, Bogor, 16128. Indonesia)

Enhancing protein utilization and growth performance in striped catfish with cinnamaldehyde and optimized energy-to-protein ratios

Indonesian Aquaculture Journal, 20(2), 2025, 221-230

Efficient dietary protein utilization is essential to reduce feed costs and environmental impacts in sustainable aquaculture. This study aimed to evaluate the effects of cinnamaldehyde (CA) supplementation in feed with various energy-to-protein (E:P) ratios on the chemical composition of Pangasianodon hypophthalmus. The five feed formulas that made up the treatment feed were as follows: 28:13-C0 (28% Protein with an E:P ratio of 13 and CIN 0 g kg⁻¹); 25:14-C1 (25% protein with an E:P ratio of 14 and CIN 1.2 g kg⁻¹); 25:14-C2 (25% protein with an E:P ratio of 14 and CIN 1.7 g kg⁻¹); 25:15-C1 (25% protein with an E:P ratio of 15 and CIN 1.2 g kg⁻¹); and 25:15-C2 (25% Protein with an E:P ratio of 15 and CIN 1.7 g kg⁻¹). Striped catfish weighing 28.06 ± 0.19 g were placed in a hapa ($2 \times 1 \times 1$ m³) at a density of 25 fish per cage. Fish were fed to apparent satiation three times daily for 60 d. The 25:14-C2, 25:15-C1, and 25:15-C2 diets increased albumin levels and reduced cholesterol, while 25:15-C2 also yielded the highest total protein and lowest triglyceride levels. Growth performance and feed efficiency were comparable among 28:13-C0, 25:14-C2, 25:15-C1, and 25:15-C2 (final weight: 141.62-143.75 g; FCR: 1.16-1.19). Protein efficiency ratio was highest in 25:15-C1 and 25:15-C2, whereas protein retention peaked in 25:14-C2. The hepatosomatic index was elevated in 25:14-C1, 25:14-C2, and 25:15-C1. Body lipid content was highest in 25:15-C1, while muscle lipid content was lowest in 25:14-C2 and 25:15-C1. Reducing dietary protein from 28% to 25% did not compromise growth performance at the E:P ratio level of 15 with a supplementation of 1.2 g kg⁻¹ CIN.

KEYWORDS: cinnamaldehyde; energy-to-protein ratio; growth; protein-sparing effect; striped catfish

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

I Nyoman Adiasmara Giri^{*)#}, Ketut Sugama^{*)}, Alimuddin^{***}, and Anang Hari Kristanto^{****})

*) Research and Development Institute for Mariculture, Gondol

**) Center for Fisheries Research and Development, Jakarta

***) Bogor Agricultural University, Bogor

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ABSTRACT (12pt Bold)

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

1. Introduction

Indonesian Aquaculture Journal has a p-ISSN 0215-0883; e-ISSN: 2502-6577 with Accreditation Number: 591/AU2/P2MI-LIPI/03/2015 (period April 2015-April 2018). First published in 2006, with the publication frequency of twice a year, in June and December. (<http://ejournal-balitbang.kkp.go.id/index.php/iaj>) is a peer-reviewed Journal Indonesian Aquaculture accept manuscripts or articles in the field of aquaculture various academics and researchers nationally.

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4. Special Instructions Content Writing Script Manuscript

TITLE ARTICLE: Article Title should be written briefly and clearly, and must pinpointing issues to be raised, does not allow its diverse interpretations, written entirely in capital letters symmetrically. Title of the article should not contain abbreviations that are not commonly used. The main ideas put forward in advance a new article is followed by other explanation.

INTRODUCTION: Introduction must contain (in order) the general background, previous literature review (state of the art) as a basis for claiming a scientific novelty of the article, a statement of scien-

tific novelty, and the research problem or hypothesis. At the end of the preliminary assessment purposes should be written the article. In the scientific article format is not allowed their review of the literature as well as in the research report, but expressed in previous literature review (state of the art) to demonstrate the scientific novelty of the article.

MATERIALS AND METHODS: Materials and methods contain the main ingredients used in the study and the methods used in solving the problems, including methods of analysis. The design and research methods must be clear so that it can be repeated by other researchers. When using the standard method must include the reference, and if the modification must be explained which parts are modified. Equipment that is written in this section only contains

major appliances equipped with the brand (eg: electric Furnace (Carbolite)) and the degree of precision tools used.

RESULTS AND DISCUSSION: The results presented clearly and concisely, can be presented in the form of tables and figures, but not duplication. Narrative should explain tables and images. Tables and figures must be referred to in the text. This discussion contains scientific explanation supported by reference. Results and discussion should be able to answer the research hypothesis. Statistical analysis of the results and discussion should include the level of confidence.

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 |

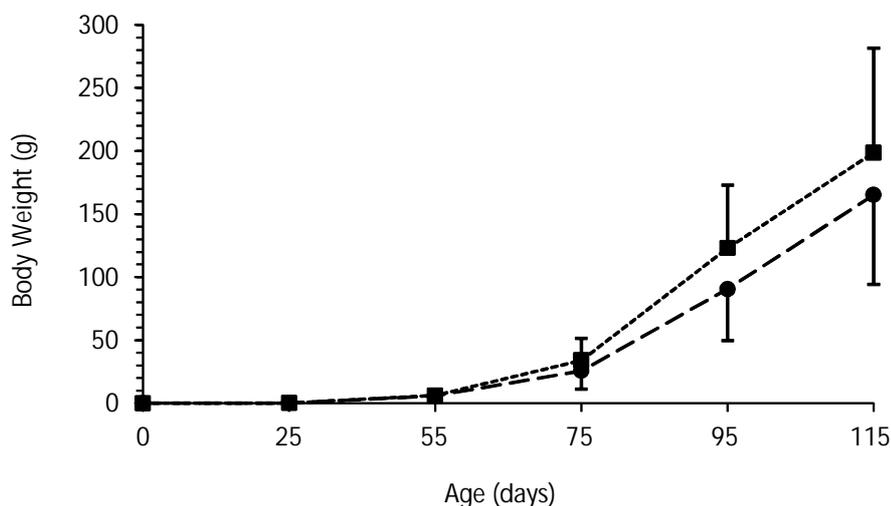


Figure 1. Growth performances based on body weight during 25 days of larval rearing phase, 30 days of nursery phase and 60 days of grow-out phase (based on samplings of 2% populations) of the third generation (■) and control population (●) of the African catfish (*Clarias gariepinus*) genetic improvement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

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REFERENCES: All references are referred to in the text of the article must be included on the List of References. References should contain reference libraries derived from primary sources (scientific journals and amounted to a minimum of 50% of the total listed below) issued 10 (ten) years. A minimum reference list contains 11 (eleven) reference. Writing in the referral system in the article text and writing a reference list using a reference management application program APA.

5. Free Writing Equations

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).

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

6. Free Writing Citations / References In Text Articles

Each fetch data or quoted from other references, the author must write the reference source. References or citations written in the description / text by the author's name and the year (Irwan & Salim, 1998). If the author of more than two, then just write the name of the first author followed by "et al." (Bezuidenhout et al., 2009; Roeva, 2012). All referenced in the text must be listed in the References section.

7. Writing Reference Cited

The format of writing a list of references following the format 6th Edition APA (American Psychological Association). Download

A reference in the form of magazines / journals:

Ariyanto, D., Hayuningtyas, E.P., & Syahputra, K. (2009). The relationship between the presence of genes Major Histocompatibility Complex Class II (MHC-II) disease resistance and growth in the population of carp strains rajadanu. *Indonesian Aquaculture Journal*, 10 (4), 461-469.

A reference in the form of titles:

Fridman, A. (2008). *Plasma Chemistry* (p. 978). Cambridge: Cambridge University Press.

In the form of reference Proceedings of the Seminar:

Roeva, O. (2012). Real-World Applications of Genetic Algorithm. In *International Conference on Chemical and Materials Engineering* (pp. 25-30). Semarang, Indonesia: Department of Chemical Engineering, Diponegoro University.

A reference in the form of a dissertation / thesis / theses:

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.

A reference in the form of patent:

Primack, H.S. (1983). Method of Stabilizing polyvalent Metal Solutions. US Patent No. 4,373,104.

Handbook of reference in the form:

Hovmand, S. (1995). Fluidized Bed Drying. In Mujumdar, USA (Ed.) *Handbook of Industrial Drying* (pp.195-248). 2nd Ed. New York: Marcel Dekker.

8. Instructions Submit Manuscripts Online

Manuscripts should be submitted through one of the following ways (the second way is preferred):

Shipping manuscript preferably with Online Submission System in the E-Journal Portal Indonesian Aquaculture Journal (<http://ejournal-balitbang.kkp.go.id/index.php/iaj>)

The first author listed as author and / or Reviewers (checking role as Author and / or REVIEWER) on the "Register" or address: <http://ejournal-balitbang.kkp.go.id/index.php/iaj/user/register>

After Writer login as Author, click on "New Submission". Stages submit article consists of five stages, namely: (1). Start, (2). Upload Submission, (3). Enter Metadata, (4). Upload Supplementary Files, (5). confirmation

Under Start, select the Journal Section (Full Article), check all of the checklist.

In the Upload Submission, please upload a manuscript file in MS Word articles in this section.

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On the Confirmation, please click "Finish Submission" if all the information is correct.

If the author difficulties in the process of submission via online system, manuscripts can also be sent via E-mail to email Editorial Journal Indonesian Aquaculture (iaj.puslitbangkan@gmail.com), however this method is not recommended.

Statement letter can be downloaded here.

9. Conclusion

Every article that is sent to the Indonesian Aquaculture Journal editorial office must follow the instructions of this writing. If the article is not in accordance with these guidelines, the writing will be restored before explored further.

10. Acknowledgements

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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.

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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.

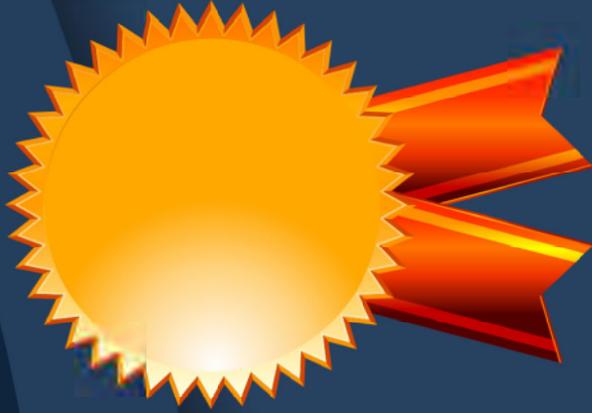
Wang, Z., Wang, N.H., & Li, T. (2011). Computational analysis of a twin-electrode DC submerged arc furnace for the production of crystal MgO. *Journal of Materials Processing Technology*, 211 (3), 388-395.

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