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Siti Zuhriyyah Musthofa, Alimuddin Alimuddin, Harton Arfah, Dinar Tri Soelistyowati, Odang Carman, Eni Kusriani (Department of Aquaculture, Faculty of Fisheries and Marine Science, IPB University)

Estimation of heritability and selection response for body length of neon tetra (*Paracheirodon innesi*) from Bojongsari District, Indonesia

Indonesian Aquaculture Journal, 21(1), 2021, 1-11

The neon tetra (Paracheirodon innesi), a popular South American ornamental fish, has become a key species in Indonesian aquaculture, with production centered in Bojongsari, Depok. However, the industry faces declining genetic quality due to inbreeding. Therefore, implementing a selective breeding program is considered an effective approach to improve genetic quality. This study aimed to estimate the heritability and selection response of the body length trait in the base population of neon tetra fish. Selection was conducted on the entire population using a within-family selection method, specifically employing broodstock from the Curug and Bojongsari populations. A reciprocal breeding design was established using four mating combinations, each comprising 25 pairs of 4- to 5-month-old broodstock (3.28 ± 0.15 cm total length; 0.43 ± 0.06 g body weight) mated at a 1:1 sex ratio. The offspring were reared separately and grown out in an aquarium for 120 days. The results showed that the estimated heritability was 0.42, with a response to selection of 0.13 cm (4.9%). Our finding of moderate heritability implies that this trait can be effectively enhanced through a systematic breeding program. These figures suggest that the selection process for the next generation of neon tetra fish remains viable.

KEYWORDS: Genetic gain; ornamental fish; *Paracheirodon innesi*; selective breeding

Abubakar Saadu, Emmanuel Ofori-Amponsah (Center of Excellence for Molecular Biology and Genomics of Shrimp, Department of Biochemistry, Faculty of Science, Chulalongkorn University, Bangkok, Thailand)

MD-2-like proteins in crustaceans: structure, immune functions, and aquaculture applications

Indonesian Aquaculture Journal, 21(1), 2026, 13-22

MD-2-like proteins belong to the MD-2-related lipid-recognition family and function as lipid-binding molecules in innate immunity. In crustaceans, these proteins have been reported to bind lipopolysaccharides and are implicated in antibacterial immune responses, despite the absence of a canonical TLR4 signaling pathway, though their precise in vivo mechanisms remain unresolved. Homologs identified in shrimp and crabs share conserved structural motifs linked to lipid binding and immune recognition. Evidence from transcriptomics, ligand-binding assays, and functional perturbation studies supports their involvement in antibacterial defense, although in vivo mechanisms remain unresolved. This narrative review synthesizes current knowledge on MD-2-like proteins of the ML (MD-2-related lipid-recognition) superfamily in crustaceans, focusing on their structure, distribution, and putative immune functions. Clarifying the biological roles of these proteins may in the future inform immune-based approaches to disease management in crustacean aquaculture, pending functional validation in vivo.

KEYWORDS: MD-2-like protein; ML domain; lipopolysaccharide; crustacean; innate immunity; aquaculture

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Indah Permata Sari, Alimuddin Alimuddin, Agus Oman Sudrajat, Tatag Budiardi (Department of Aquaculture, Faculty of Fisheries and Marine Science, IPB University)

Effects of dietary recombinant growth hormone with waterborne calcium carbonate supplementation on growth performance and gh-igf axis-related gene expression in juvenile snakehead (*Channa striata*)

Indonesian Aquaculture Journal, 20(1), 2026, 23-33

This study evaluated the effects of dietary recombinant growth hormone (rGH) and waterborne calcium carbonate (CaCO₃) supplementation on growth performance, feed utilization, body composition, and growth-related gene expression in snakehead (Channa striata) juveniles. The experiment was conducted for 90 days using four treatments: control (R0C0, without rGH and CaCO₃ supplementation), treatment 1 (R5C0, 5 mg kg⁻¹ rGH and without CaCO₃ supplementation), treatment 2 (R5C25, rGH and 25 mg L⁻¹ CaCO₃ supplementation), and treatment 3 (R5C50 rGH and 50 mg L⁻¹ CaCO₃ supplementation), each with six replicates. The results showed that rGH significantly increased final body weight (BWt) and specific growth rate, and reduced feed conversion ratio (FCR) compared with the control. Final body weight was significantly higher in R5C0 and R5C50 than in the control, with no significant difference between these treatments. In contrast, body length increased significantly with increasing CaCO₃ dose, with the highest value observed in R5C50. Feed conversion ratio decreased significantly in all rGH treatments but did not differ among R5C0, R5C25, and R5C50. Protein and lipid retention were highest in R5C0 and decreased with CaCO₃ supplementation. Body calcium content increased with CaCO₃ supplementation, with the highest value observed in R5C50. Gene expression analysis showed that rGH significantly increased GH and IGF-1 expression compared to the control, while no consistent significant differences were observed among combined treatments. These findings suggest that rGH predominantly enhanced weight gain and feed utilization, whereas CaCO₃ supplementation under rGH treatment was associated with increased body length. The combined treatments resulted in complementary but parameter-specific effects.

KEYWORDS: Calcium; Growth; Recombinant Growth Hormone; *Channa striata*

Kasful Anwar, Gunawan Gunawan, Mugi Mulyono, Ofan Bosman, Muhamad Husnan (Universitas Terbuka)

Gastrointestinal enzyme activity of yellowfin tuna larvae (*Thunnus albacares*)

Indonesian Aquaculture Journal, 21(1), 2026, 35-42

Knowledge of morphological development, digestive system, and digestive enzymes in larvae is key to developing optimal larval and seedling maintenance strategies. The purpose of this study was to determine the digestive system and digestive enzyme activity in yellowfin tuna (Thunnus albacares) larvae cultivated in hatcheries. Yellowfin tuna eggs were spread in concrete tanks measuring 3x2x1.2 m (volume 6 m³), with 90,000 eggs per tank. The analysis of digestive enzymes in yellowfin tuna larvae in this study included protease, amylase, and lipase enzymes. Digestive enzyme analysis method using a spectrophotometer with a wavelength of 340–560 nm. Enzyme analysis was performed on tuna eggs and larvae at stages D-1, D-4, D-7, D-10, D-15, and D-20. The results showed that the digestive enzyme activity of yellowfin tuna (protease, amylase, and lipase) was detected while still in the egg stage and was also detected in D-1 larvae. The emergence of digestive enzymes is triggered by internal mechanisms related to the development of the digestive system. The presence of all digestive enzymes (protease, amylase, and lipase) in yellowfin tuna larvae indicates the importance of these enzymes in early development.

KEYWORDS: enzymes; larvae; *Thunnus albacares*; tuna

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Romi Novriadi, Mila Wahyuningsih, I Gusti Ngurah Permana, Ketut Mahardika, Didi Widjaya, Nguyen Ngoc Binh, Hervé Lucien- Brun (Department of Aquaculture, Jakarta Technical University of Fisheries (Politeknik Ahli Usaha Perikanan), Ministry of Marine Affairs and Fisheries, Republic of Indonesia)

Effects of exogenous protease supplementation in palm kernel meal-based diets on growth performance and health condition of pacific white shrimp (*Penaeus vannamei*) cultured in hapa nets

Indonesian Aquaculture Journal, 21(1), 2026, 43-56

*The effect of exogenous protease complex (Jefo Protease, Jefo Nutrition Inc., Saint-Hyacinthe, QC, Canada) was investigated for 90 days on the forty hapa nets (2 m × 2 m × 1 m, 200 shrimps per hapa net) with five replicates for each treatment groups to the growth, health condition, and also histological condition of the distal intestine and hepatopancreas of the shrimp *Penaeus vannamei*. Treatments were generally grouped into feed groups supplemented with protease and without protease. The first diet in the protease group was formulated using 40% soybean meal (SBM) and supplemented with protease (0JPKM). Then, the following three experimental feeds were formulated with reduced inclusion levels of SBM, replaced with 5, 10, and 15% palm kernel meal (PKM), supplemented with protease, and labeled as 5, 10, and 15 JPKM. For feed without protease, a similar formulation was used as the protease group without adding protease and labeled as 0, 5, 10, and 15% PKM. In our study, adding protease improved shrimp growth performance; even the inclusion of 5% PKM to replace SBM supplemented with protease (5JPKM) had the same growth as the shrimp fed with SBM without protease (0 PKM). Data on the total hemocyte count (THC) of shrimp showed an increase in the group with protease supplementation compared to those without protease supplementation. Meanwhile, lysozyme activity did not significantly differ. Histomorphology evaluation data in the hepatopancreas and intestine of shrimp showed better morphology in shrimp supplemented with protease compared to the group of shrimps that were not supplemented with protease. These results show that protease supplementation in feed protease with an inclusion level of 0.18% could significantly improve growth performance, THC, and digestion in *P. vannamei* shrimp.*

KEYWORDS: Protease; Palm kernel meal; Growth; Health; *Penaeus vannamei*

Rashidah Abdul Razak, Muhammad Fitri Yusof, Syamsul Ahmad Ariffin, Muhamad Zudaiddi Jaapar, Amatul Samahah Md Ali (Institute of Oceanography and Maritime Studies, IIUM, 25200 Kuantan Pahang, Malaysia)

A decade of probiotic aquaculture practice: bibliometric insights into trends, players, and emerging topics

Indonesian Aquaculture Journal, 21(1), 2026, 57-68

*Probiotics in aquaculture gain research interest due to their potential to improve production and promote sustainable aquaculture. This study aims to systematically identify the trend, topic of interest, key players and collaboration in probiotic aquaculture research field for past 10 years. We conducted a bibliometric analysis using Scopus to collect and analyse scholarly publications related to probiotic in aquaculture. The sample is composed by 1467 articles in total with increase trends pattern in number of publications per year. Metrics such as citation counts, co-authorship networks, and keyword co-occurrence were employed to unveil the research landscape. The VOSviewer tool was utilized for network visualizations, offering insights into collaboration patterns and thematic clusters. Preliminary findings indicate increasing trend in terms of documents per year, with countries such as China, India, Spain and US playing pivotal roles in number of publications. Keyword co-occurrence analysis uncovers central themes is probiotic and aquaculture, while emerging topics such as intestinal health, *Penaeus vannamei*, bacteria, and water quality start to be explored. Citation analysis discovers most contributing authors, countries, institution, and journals in this research area. The co-authorship network analysis reveals clustering of collaborations between countries, emphasizing the global interest research of probiotic in aquaculture. We concluded that global theme will remain the major focus with new collaborations focus on specific niche in this research will emerge as it benefits the contributing countries.*

KEYWORDS: Probiotic; aquaculture; gut microbiota; immune response; growth

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Musrat Jebin, Tanzila Gias, Md. Rabiul Islam, Umme Kaniz Fatema, Dinesh Chandra Shaha, Md. Amzad Hossain (Department of Aquaculture, Gazipur Agricultural University, Gazipur, Bangladesh)

Evaluation of banana peel extract and hydrolysate as alternative media for *Daphnia magna* culture

Indonesian Aquaculture Journal, 21(1), 2026, 69-76

*The high cost and technical requirements of live-food production limit its large-scale use. Although daphnia (*Daphnia magna*) is a promising live feed for fish larvae, microalgal feeds commonly used for its cultivation are costly. This study aimed to assess the performance of banana peel extract (BPE) and banana peel hydrolysate (BPH) to be used as cheap alternative culture media for *D. magna*. *D. magna* was cultured for 18 days where six experimental treatments namely, T1 (*D. magna* cultured with live *Chlorella* sp., control), T2 (1% BPE), T3 (5% BPE), T4 (1% BPH), T5 (5% BPH) and T6 (1% BPE + 1% BPH) were designed with three replications each. The results indicated that population density (510.64 ± 11.07 ind. L⁻¹) at the peak and offspring number at the first reproduction (9.50 ± 0.26 ind. L⁻¹) in T4 were similar to those in control T1; however, significantly higher ($p < 0.05$) than in the other treatments. Moreover, a significantly lower ($p < 0.05$) age at first reproduction (5.47 ± 0.25 days) was recorded in T4 compared with the other treatments. Therefore, the findings of this study revealed that a 1% banana peel hydrolysate medium may provide a low-cost substrate option for *D. magna* culture.*

KEYWORDS: Age at first breeding; agricultural waste; live food culture; low-cost media

Nushrat Jahan, Mohammad Abu Baker Siddique, Imran Bin Younos, Ilias Ahmed, Md Shiekh Tauhiduzzaman Shimul, Safiara Nusrat Nova, Balaram Mahalder, Mohammad Mahfujul Haque, Mariom Mariom, A. K. Shakur Ahammad (Department of Fisheries Biology and Genetics, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh)

Effects of environmental and water quality variations on hematological parameters of Nile tilapia (*Oreochromis niloticus*) reared in pond and recirculating aquaculture systems

Indonesian Aquaculture Journal, 21(1), 2026, 77-95

*Aquaculture is crucial for global food security, yet environmental change threatens fish health, particularly in freshwater species like Nile tilapia (*Oreochromis niloticus*). This study aimed to evaluate the effects of environmental and water quality variations on the hematological responses of Nile tilapia reared in outdoor pond systems and indoor Recirculating Aquaculture Systems (RAS). The study was conducted over a 12-month duration (June 2023 to May 2024) using three replicate outdoor earthen ponds and three indoor RAS tanks. Daily data regarding environmental variables were collected from the government Meteorological Department, while water quality parameters were monitored on-site daily and biological sampling was conducted four times monthly. Tilapia managed within the RAS system exhibited higher mean RBC counts (1.512×10^6 /mL), which may be associated with improved oxygen availability and stable environmental conditions, while outdoor pond fish showed higher mean WBC (389.188×10^3 /mL) and elevated glucose (122.675 mg/dL) level, potentially reflecting physiological or immunological responses to fluctuating environmental conditions. All hematological parameters differed significantly between systems ($p < 0.05$). RAS maintained more stable water quality, with higher DO (8.53 mg/L vs. 7.03 mg/L in ponds, $p < 0.001$) and zero ammonia, though TDS was higher (242.301 ppm, $p = 0.034$). Pond environments experienced greater temperature fluctuations, with rainfall contributing to reduction in pH. Environmental and water quality variables strongly shaped hematological responses, highlighting their role in fish welfare. Environmental and water quality variables showed measurable associations with hematological responses, highlighting their potential influence on fish welfare. The findings suggest that RAS may support improved environmental stability and physiological condition through controlled water quality management, with potential implications for fish health, broodstock quality, and sustainable aquaculture development.*

KEYWORDS: Climate change; Fish; *Oreochromis niloticus*; Hematology; Tilapia; Aquaculture; Growth; RAS

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Raismin Kotta, Irzal Effendi, Iis Diatin, Tatag Budiardi (Doctoral Program in Aquaculture Science, Faculty of Fisheries and Marine Sciences, IPB University, Bogor)

Evaluation of the Indonesian pearl and pearl oyster market

Indonesian Aquaculture Journal, 21(1), 2026, 97-113

*Evaluation of the Indonesian pearl market is still dominated by trade analysis, while integration of export data with field information on supply chains and market dynamics has been limited. This study aims to evaluate the pearl and pearl oyster (*Pinctada maxima*) market in Indonesia through an analysis of export trends, changes in trade value, and supply chain conditions during the 2020–2024 period. The study used a survey method approach with primary data collection through field observations and in-depth interviews with 45 respondents consisting of cultivators, traders, and consumers in North Lombok, East Lombok, and West Sumbawa, supported by secondary data from government agencies and the Indonesian Pearl Cultivation Association. The analysis was conducted descriptively using Microsoft Excel and SPSS. The results show that the total volume of Indonesian pearl exports during the observation period reached 46,072 kg with an export value of approximately USD 309.8 million. Although export volume decreased in 2023–2024, export value increased significantly in 2023 to USD 112.9 million, indicating an increase in average prices or a shift towards higher value-added products. Interview findings and field observations revealed that product quality, premium market preferences, and challenges in the supply chain and international marketing standards were the main factors influencing export performance. It was concluded that the competitiveness of the Indonesian pearl market is supported by increasing product value, but supply chain strengthening, quality standardization, and sustainable marketing strategies are still needed to maintain export growth..*

KEYWORDS: *Pinctada maxima*; pearl oyster; market analysis; export value; supply chain Indonesia

Md. Raihan Ahmed, Mst. Nahid Akter, Sheik Istiak Md. Shahriar, Moumita Habiba Sarmin Dorin, Akhtaruzzaman, and Md. Mehedi Hasan (Department of Aquaculture, Faculty of Fisheries, Hajee Mohammad Danesh Science and Technology University, Dinajpur - 5200, Bangladesh)

Efficacy of multi-strain probiotics on growth performance, feed utilization, proximate composition, and haematological parameters of Asian Catfish (*Clarias batrachus*) juveniles

Indonesian Aquaculture Journal, 21(1), 2026, 115-125

*This study was conducted to determine the effects of different commercial probiotics on the growth performance, feed utilization, proximate composition, and haematological parameters of Asian catfish (*Clarias batrachus*) juveniles. The study design consists of a total of 300 fish (avg. wt. 11.14 ± 0.5 g) randomly distributed in twelve tanks with a stocking density of 25 fish/tank. Fish diets were formulated using 0.2% of three different commercial probiotics namely T1, CP-1; T2, CP-2; and T3, CP-3, and a control diet without probiotics. Fishes were fed at a rate of 3% body weight twice daily. The growth performance indicators i.e. final body weight (g), weight gain (g) and specific growth rate (%/day), were found to be highest in T3 (CP-3) and were significantly different from the others. Similarly, feed utilization (feed conversion ratio) was significantly improved in fish fed 0.2% probiotic diet. Among body indice parameters, intra peritoneal fat (%) reduced significantly in probiotic fed groups. Besides, highest percentage of protein (79.52 ± 0.61) and lowest lipid content (6.14 ± 0.25) were recorded in T3 (CP-3) supplemented diet. Haematological parameters especially percentage of packed cell volume and white blood cell were escalated in T1 (CP-1) and T3 (CP-3) whereas mean corpuscular volume found comparatively lower in control. Therefore, finally the results of principal component analysis concluded that the incorporation of probiotic T3 (CP-3) at 0.2% in diet proved more effective for the improvement of growth performance, proximate composition and haematological parameters for *C. batrachus* juvenile farming.*

KEYWORDS: *Clarias batrachus*; growth; haematology; probiotic; and proximate composition

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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

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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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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

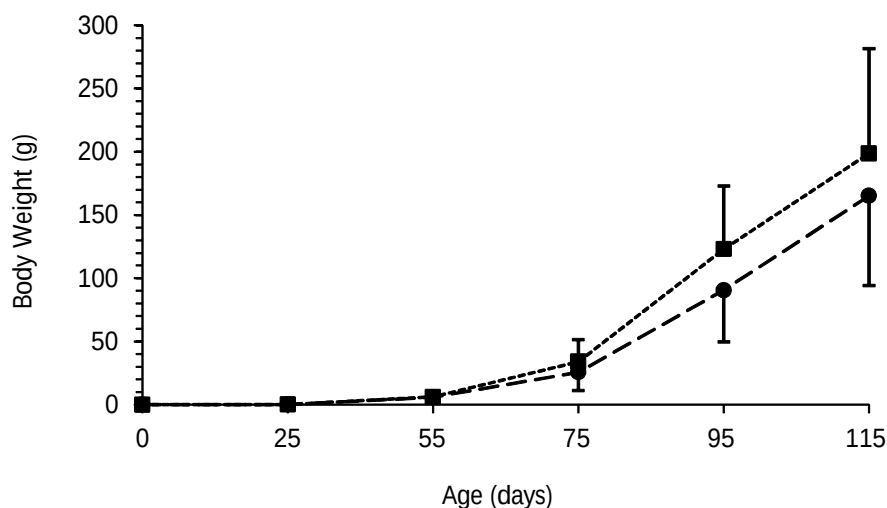


Figure 1. Growth performances based on body weight during 25 days of larval rearing phase, 30 days of nursery phase and 60 days of grow-out phase (based on samplings of 2% populations) of the third generation (■) and control population (●) of the African catfish (*Clarias gariepinus*) genetic improvement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

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

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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.

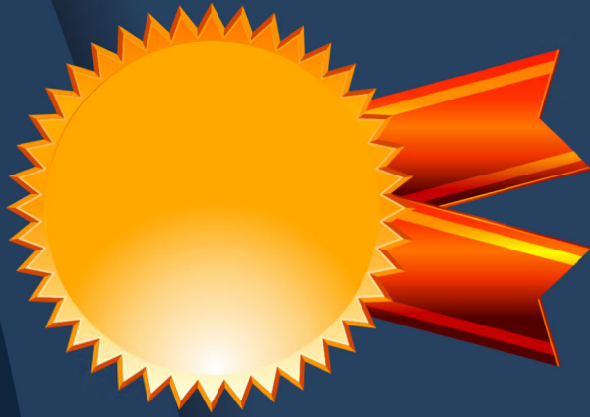
- Bhaktavatsalam, A.K. & Choudhury, R. (1995). Specific Energy Consumption in the Steel Industry. *Energy*, 20 (12), 1247-1250.
- Camdali, U. & Tunc, M. (2006). Steady State Heat Transfer of Ladle Furnace Steel During Production Process. *Journal of Iron and Steel Research, International*, 13 (3), 18-20.
- 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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