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UDC 639.31

Bambang Iswanto, Rommy Suprpto, Huria Marnis, and Imron (Research Institute for Fish Breeding)

Morphological characteristics of a red strain of the Egyptian African catfish (*Clarias gariepinus* Burchell 1822)

Indonesian Aquaculture Journal, 11(2), 2016, 49-59

Characteristics of the Egyptian African catfish (*Clarias gariepinus*) strain introduced to Indonesia has not been extensively explored yet, especially the red strain. Previous studies suggested that at the same body length, body weight of the red strain was higher and it was more rotund than that of the normal (black) ones. These differences need to be further investigated to find out which parts of the body mainly contributed to shape the differences. The present study was carried out to explore morphological differences of the red strain of Egyptian African catfish compared to the black strain through morphometric and meristic characterizations. Meristic and morphometric characterizations in the present study were carried out following standard method for morphological characterization of *Clarias* catfish. The fish samples consisted of each 35 red and black table-sized fish samples resulted from inbred and outbred spawnings. Results of the morphometric and meristic analysis in the present study revealed that the red strain of Egyptian African catfish resulted from inbred spawning of red strain brooders was morphologically different from that of either parental fishes or the black strains. At the same body length, head of the red strain was bigger (wider and longer) than other strains, and its body was stumpy (more rotund and shorter than other strains), deviated from those normal characteristics of the Egyptian African catfish. Its meristic characters were also differed from those of other strains, assigned by reduced dorsal and anal fin rays number.

KEYWORDS: meristic; morphometric; red strain of Egyptian African catfish, *Clarias gariepinus*

UDC 639.3.43

Didik Ariyanto dan Evi Tahapari (Research Institute for Fish Breeding)

Abundance and utilization of natural life feed for rearing of Asian catfish (*Pangasianodon hypophthalmus*) larvae in outdoor pond

Indonesian Aquaculture Journal, 11(2), 2016, 61-67

In early rearing period, the larvae of Asian catfish (*Pangasianodon hypophthalmus*) were fed with *Artemia* nauplii at the first 10 days. Since *Artemia* cyst price is quite expensive, it will be a constraint in development of the Asian catfish hatcheries. This study was conducted to evaluate the abundance of natural life food in pond and utilization of it for substitute *Artemia* cyst in Asian catfish larvae rearing. The Asian catfish larvae at the age of 5 days after hatching were used as the test fish. Sampling of natural life food in fertilized pond was conducted before the fish stocked. The fish larvae were stocked in pond after ten days from ponds fertilizing. At the 2nd day after larvae fish was stocked, five fish samples were collected for identify the type of food which consumed by fish. The results showed that abundance of natural life food which found in ponds ranged from 70,200 to 180,600 individual/L. Index of diversity, uniformity and dominancy for phytoplankton and zooplankton ranged from 2.407 to 2.732; from 0.032 to 0.043 and from 0.112 to 0.204, respectively. Based on the analysis of digestive tract of fish, it was found that index of selectivity and index of preponderance for natural life food ranged from 0.94 to 0.62 and from 0.17 to 67.03, respectively. This study suggested that Asian catfish larvae at the age of five days after hatching can utilize the natural life food in ponds to replace the use of *Artemia* cyst in indoor hatchery system.

KEYWORDS: Asian catfish larvae; natural life feed; utilization; outdoor rearing system

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Rosmiati, Samuel Lante, and Emma Suryati (Research Institute for Coastal Aquaculture)

The effect of phytoecdysteroid of *Cycas revoluta*, *Portulaca oleracea*, and *Morus* sp. on molting period, growth and survival rate of tiger shrimp, *Penaeus monodon*

Indonesian Aquaculture Journal, 11(2), 2016, 69-74

Artificial insemination (AI) is an alternative to increase egg fertilization which can be used to support tiger shrimp, *Penaeus monodon* domestication. Nevertheless, the problem is difficult for shrimp to molt. Ecdysteroid hormone has been reported to stimulate molting of tiger shrimp. This study aims to isolate ecdysteroid hormone from *Cycas revoluta*, *Portulaca oleracea*, and *Morus* sp. and to evaluate its effect on molting period, growth and survival rate of tiger shrimp. Isolation of ecdysteroid from the leaves of three plant species was carried out by maceration and solvent partition method. Purification of ecdysteroid used repeated column chromatography and preparative thin layer chromatography (TLC). Identification of ecdysteroid was carried out by comparison of TLC profiling of ecdysteroid isolated to that of standard. Evaluation of the isolated phytoecdysteroid hormone effect on molting period, growth and survival rate of shrimp was done by injecting of 100 μ L phytoecdysteroid (27.5 μ g/shrimp) at the first somite of ventral abdomen. As the comparison, the commercial ecdysteroid (positive control) and sterile saline solution (negative control) were also injected at the concentration of 8.6 μ g/shrimp and 0 μ g/shrimp, respectively. Finding showed that phytoecdysteroid isolated was identical to that of the standard (20-hydroxyecdysone). The highest percentage of phytoecdysteroid was obtained in *Portulaca oleracea*, followed by *Morus* sp. and *Cycas revoluta* with the ecdysteroid content of 0.43%, 0.22%, and 0.09%, respectively. Phytoecdysteroid isolated from the three plants was able to shorten molting period of shrimp into 4, 4, 2, and 5 days earlier for *Portulaca oleracea*, *Morus* sp., *Cycas revoluta*, and positive control, respectively, compared to the negative control. The highest survival rate and growth were obtained at the treatment of *Portulaca oleracea*, followed by *Morus* sp. and *Cycas revoluta* with the survival rate, length and weight increase of 86%, 75%, and 25 %, 4.42%, 2.26%, and 2.16%, and 15.90%, 10.55%, and 8.73%, respectively. The highest THC was showed by the treatment of *Morus* sp. (424 cell/mL), followed by *Portulaca oleracea* (260 cell/mL), *Cycas revoluta* (164 cell/mL). In contrast, THC value of the negative control was decreasing into 40 cell/mL.

KEYWORDS: *Portulaca oleracea*; *Morus* sp.; *Cycas revoluta*; phytoecdysteroid; molting

UDC 639.31

Vitas Atmadi Prakoso, Jun Hyung Ryu, Byung Hwa Min, Rudhy Gustiano, and Young Jin Chang (Institute for Freshwater Aquaculture Research and Development)

Effects of different salinity levels on physiological and hematological response of rock bream *Oplegnathus fasciatus*

Indonesian Aquaculture Journal, 11(2), 2016, 75-79

Rock bream *Oplegnathus fasciatus* is one of economically important marine fish species in East Asia. However, lack of information about the salinity tolerance of rock bream related to its physiological response made this issue were needed to be studied. The present study was conducted to determine the effects of different salinity levels on physiological and hematological response of rock bream in order to obtain its salinity tolerance. Twelve rock breams (total length: 26.9 \pm 0.6 cm, body weight: 477.3 \pm 61.9 g) were used for experiments. Four experimental groups with three replications were conducted to measure the effects of salinity (5, 15, 25, and 35 practical salinity unit (psu)) on physiological and hematological response of rock bream. Fish were stocked into the chamber inside the closed recirculation system. At the end of each experiment, blood samples were collected. The study revealed that lower salinity exposure had tendency to decrease the physical and chemical properties of blood in rock bream. The value of Na⁺, Cl⁻, Ca, Mg, and osmolality showed tendency to decrease with lowering salinity, while cortisol and glucose showed tendency to increase from 35 psu to low salinity environment, indicating the enhancement of fish stress and resulted in fish mortality at 5 psu. The lowest cortisol value was 76.3 ng/mL in 25 psu, and the highest value was 188.8 ng/mL in 5 psu. Meanwhile, the lowest glucose value was 35.3 mg/dL and the highest value was 166.7 mg/dL (P<0.05). Results indicate that rock bream could tolerate lower salinity up to 15 psu.

KEYWORDS: *Oplegnathus fasciatus*; salinity; physiological response; hematology

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UDC 639.3.09

Isti Koesharyani, Lila Gardenia, and Ni Luh Anggra Lasmika (Centre for Aquaculture Research and Development)

Molecular detection and cloning for rickettsia-like bacteria of milky haemolymph disease of spiny lobster *Panulirus* spp.

Indonesian Aquaculture Journal, 11(2), 2016, 81-86

Spiny lobster (*Panulirus homarus* and *Panulirus ornatus*) are important commodities for Indonesia. The aquaculture of lobster is susceptible for several diseases like parasite, fungi, bacteria, and virus. Among those diseases, milky haemolymph disease (MHD) is often seen as a symptom to mass mortality occurred at lobster farms in Gerupuk Bay of Lombok. The purpose of this study was to determine the lobster diseases on cage culture in Gerupuk Bay of Lombok, West Nusa Tenggara. The study was undertaken from January to March 2015. Diseases status was determined by application of molecular platform, polymerase chain reaction (PCR) with designation of specific primer for MHD (254F/R), 254F: 5'-CGA-GGA-CCA-GAG-ATG-GAC-CTT-3' and 254R: 5'-GCT-CAT-TGT-CAC-CGC-CAT-TGT-3' with PCR size product of 254 bp. and for cloned the pathogen was used TA-cloning Invitrogen for the DNA plasmid as positive control for other analysis. Several tissue samples i.e hepatopancreas, haemolymph, part of muscle hepatopancreas *P. homarus* and *P. ornatus* were taken from cage culture farms at Gerupuk Bay then preserved on 90% ethanol for further analysis by PCR and then the amplified DNA were cloned into pCR[®]2.1 plasmid and transformed into competent *E. coli*. The result showed that almost all lobster samples from Gerupuk Bay were positive infected by MHD, as the results of PCR amplification whereas the band appeared at 254bp. Also MHD plasmid has been successfully cloned and will be used for further examination. Histopathologically in hepatopancreas infection have seen necrosis that contain numerous of rickettsia-like bacteria.

KEYWORDS: lobster; diseases; MHD; rickettsia

UDC 639.3.09

Ketut Mahardika, Indah Mastuti, Ahmad Muzaki, and Sudewi (Institute for Mariculture Research and Development)

Addition of adjuvants in recombinant subunit vaccines for the prevention of grouper sleepy disease iridovirus (GSDIV) infection in humpback grouper, *Cromileptes altivelis*

Indonesian Aquaculture Journal, 11(2), 2016, 87-95

Infection of grouper sleepy disease iridovirus (GSDIV) which is a member of *Megalocytivirus* causes mass mortalities in marine fish in Indonesia. This study was conducted to know the effectiveness of recombinant subunit vaccine of GSDIV with an addition of adjuvants against GSDIV infection. Inactive bacteria *Escherichia coli* containing recombinant MCP-GSDIV protein was added with montanide ISA adjuvant at a ratio of 3:7. The vaccine was administered to humpback grouper, *Cromileptes altivelis* by intramuscular and intraperitoneal injection at a dose of 0.1 mL/fish. Test of the vaccine in humpback grouper was performed in four replicates (four trials). Results of the vaccination showed that the recombinant protein vaccine added with the adjuvant increased immunity of humpback grouper, indicated by higher relative percent survival (RPS= 77.78%) compared to negative control (PBS) and 50% higher compared to protein control (pET Sumo CAT) at two weeks post vaccination. The RPS values of the recombinant protein vaccine were still higher (53.57%-72.73%) than those of the control vaccine and 25%-53.33% of the protein control in the 4th week post vaccination. GSDIV detection by PCR showed that MCP-GSDIV-DNA and pET Sumo CAT-DNA were not detected in the vaccinated fish after one, two, three, and four weeks post vaccination. The fish died in both of vaccinated and control groups after experimental challenge with GSDIV were found to be infected with GSDIV. It can be stated that recombinant subunit vaccine of GSDIV with the addition of montanide ISA adjuvant could be used to prevent and diminish mortalities of grouper against GSDIV infection.

KEYWORDS: MCP-GSDIV; *Megalocytivirus*; subunit vaccine; humpback grouper

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

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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

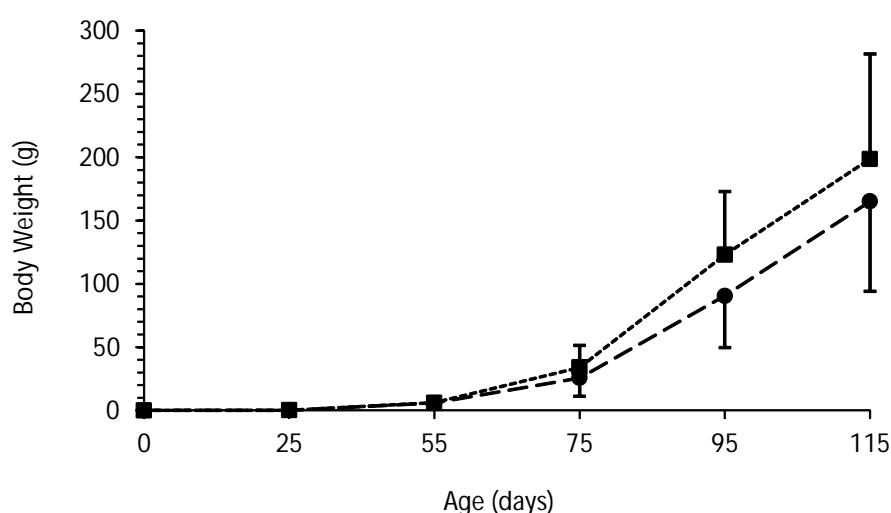


Figure 1. Growth performances based on body weight during 25 days of larval rearing phase, 30 days of nursery phase and 60 days of grow-out phase (based on samplings of 2% populations) of the third generation (■) and control population (●) of the African catfish (*Clarias gariepinus*) genetic improvement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

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.

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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10. Acknowledgements

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11. References

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