Haematological Performances of Jaundice Catfish (*Clarias gariepinus*, Burch)

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Abstract

Sri Hastuti and Subandiyono. 2013. Haematological Performances of Jaundice Catfish (Clarias gariepinus, Burch). International Conference of Aquaculture Indonesia 2012. The research was aimed to study hematological performances of jaundice and healthy catfish (*Clarias gariepinus*, Burch.). Fifty fish (i.e. twenty fifth jaundice and twenty fifth healthy catfish) were collected and analyzed for their hematological parameters. The blood samples were taken from caudal vein of the fish by using 2.5 ml-spuit, and then were collected into bottle samples with no or containing anticoagulant of 1% EDTA. Blood samples in the bottles with anticoagulant were used for blood cell counting and blood glucose analysis. Total billirubin, direct and indirect billirubin, and transaminase enzymes were measured from serum of the blood samples without anticoagulant. Results showed that the blood cells (i.e. leucocytes, erythrocytes, hemoglobin, and haematocrit) of the jaundice catfish were lower than the healthy catfish. On the other hand, the blood glucose concentration of the jaundice fish was higher. The direct and indirect billirubin concentration of the jaundice catfish was also higher, which indicated that the jaundice catfish was hiperbillirubin. However, both jaundice and heathly catfish performed high concentration of the transaminase enzymes in their blood serum. It was suggested that the hiperbillirubin-jaundice fish was mal function of their hepar and showing a stress symptoms.

Keywords: Billirubin, Blood glucose; *Clarias gaiepinus*; Hematology; Jaundice catfish; Transaminase enzyme

Introduction

Dumbo catfish (*Clarias gariepinus*, Burch.) is one type of fish that has a fast growth rate. Dumbo catfish are carnivorous, a tropical freshwater fish that have high economic value and more consumed by the people of Indonesia. This fish was introduced into Indonesia since the early 1980s, and soon spread to all corners of the country because it is easy to adapt to the tropical environment of Indonesia.

At present, African catfish (*Clarias gariepinus*, Burch) fishing has been much cultivated by the people of Indonesia. One of the location of African catfish aquaculture production which has been known nationally is the Kampung Lele, located in District of Sawit, Boyolali regency, Central Java. Catfish have additional breathing apparatus called arborescent (Vivien et al., 1977) so that this type of fish can be kept in water with dissolved oxygen (DO) is relatively low. In addition, catfish can be cultivated with a very high stocking density without having problems of oxygen deficiency.

African catfish aquaculture systems practiced in the village of Lele, Boyolali is super intensive aquaculture systems. African catfish aquaculture is to apply a high stocking density, ie 300-500 fish/m2 with artificial feeding. However, the management of water is minimal, so there is a problem a yellow catfish. Until now, the jaundice catfish and the phenomenon is not known. Jaundice catfish appeared in the village after the maintenance period approaching harvest. Jaundice catfish are very detrimental, because the jaundice catfish have a lower selling price of about 60-80% of healthy fish. In this study take the example of jaundice catfish and catfish healthy from the same pool to be identified haematological and enzim conditions.

Jaundice catfish associated with yellow pigmentation of the skin of fish. Yellow pigmentation of the skin is an indicator of increased production or decreased elimination of bilirubin by the liver (Clayton, 2009). Bilirubin is the end product of haem breakdown. Haem will have a number of complex chemical reactions into bilirubin. Most of haem derived from the breakdown of red blood cells or erythrocytes old (ie 80-85%) and a small haem from haem-containing proteins such as cytochrome P450. Indicate the presence of serum bilirubin increased production, decreased decision by the liver or conjugated bilirubin, or decreases biliary excretion. Associated with liver function, so

in this study to analyze the concentrations of liver enzymes serum transaminase enzymes which reflect the function of liver physiology.

This study aims to determine the concentration of glucose in the blood cells of jaundice and catfish healthy, knowing the concentration of bilirubin and transaminase enzymes in the blood serum yellow catfish (jaundice) and, healthy catfish.

Materials and Methods

Materials

A total of 50 jaundice catfish and healthy catfish taken from the healthy maintenance of farmers' ponds in the "Kampung Lele", Boyolali. Length and average weight of each was 60 ± 20 g and 24 ± 5 cm. Selected fish coudalis venous blood drawn through using a syringe with a capacity of 2.5 ml. Furthermore, blood samples were inserted into the two kinds of bottles, the bottles with 1% EDTA anticoagulant and bottles without anticoagulant. Analysis of cell concentration and blood glucose performed on blood samples in vials containing anticoagulant. While the analysis of the concentration of bilirubin and transaminase enzymes performed on blood samples in vials without anticoagulant. Method of Bilirubin test acording Jendrassik and Grof (1938). Methode of Enzym transaminase test according Thefeld (1974).

The Design of Experiments

This study uses a design that is explorative, by taking the example of yellow catfish and catfish in the field healthy. Examples of selected fish then have blood drawn for measurement of the concentration of blood cells, blood glucose, bilirubin and transaminase enziym. As supporting data measured water quality parameters. The data obtained were then analyzed descriptively, using tables and graphs and compared with standard values. Graph made with Excel program.

Measurement of Variables

Blood cells are composed of leuocytes, erythrocytes, hemoglobin, hematocrit and platelet concentration was measured by using ABX Micros 60. Photometeric blood cells counted. Such a device is connected to the printer so that the measurement results will be printed directly to the printer. Glucose in the blood were analyzed by means of ON Call Plus. Blood glucose concentration measured by the enzymatic reaction between glucose in blood samples with glucose oxidase and potassium ferrisianida which produces potassium ferrosianida. Potassium ferrosianida formed with a certain proportion of blood glucose levels. Oxidation of potassium ferrosianida generate electricity which is then converted into glucose concentration. Total bilirubin and direct bilirubin was measured by photometric method, which is a modification of the method of Jendrassik and Grof (1938). The principle of the method is that bilirubin reacted with DSA (diazotized sulphanilic acid) and form a red color. Absorbance values with a wavelength of 546 nm is a direct proportion of the bilirubin concentration. Glucoronid bilirubin dissolved in water reacts directly with DSA, whereas indirect bilirubin is conjugated with albumin will react with DSA only if there is an accelerator. Thus, total bilirubin = direct + indirect bilirubin. The reaction equation is as follows:

Sulphanilik acid + sodium nitrit → DSA
Bilirubin + DSA → DIRECT Bilirubin
Bilirubin + DSA + acselerator → Total azobilirubin (Jendrassik and Grof, 1938).

Transaminase enzyme activity consisting of GPT and GOT in the blood serum and catfish, yellow catfish healthy measured using the kinetic methöd and read the UV photometry. The principle of measuring the reaction of GPT (ALAT) is as follows:

$$\text{2-oxaloglutarate} + \text{L alanin} \xrightleftharpoons{\text{GPT}} \text{L-glutamat} + \text{pyruvat}$$

$$\text{Pyruvat} + \text{NADH} + \text{H}^{+} \xrightleftharpoons{\text{LDH}} \text{L-laktat} + \text{NAD}^{+}$$

The principle of measuruing the reacton of GOT (ASAT) is as follows:

$$\text{2-oxaloglutarat} + \text{L-aspartate} \xrightleftharpoons{\text{GOT}} \text{L-glutamat} + \text{oxaloacetate}$$

$$\text{Oxaloacetate} + \text{NADH} + \text{H}^{+} \xrightleftharpoons{\text{MDH}} \text{L-malate} + \text{NAD}^{-}$$

Results and Discussion

Results

The results of measurements of various haematological parameters of healthy catfish and yellow catfish (*Clarias gariepinus*) in response to a super-intensive culture system in the village catfish are presented in Figure 1. Based on Figure 1 shows that the yellow catfish has a concentration of various blood cells lower than healthy catfish. Compared with standard values blood cell concentration in the catfish, which consists of total leucocytes, erythrocytes, hemoglobin, and haematocrite seen that yellow catfish contain lower concentrations of these cells from their default values, except for the concentration of platelets is in the normal level.

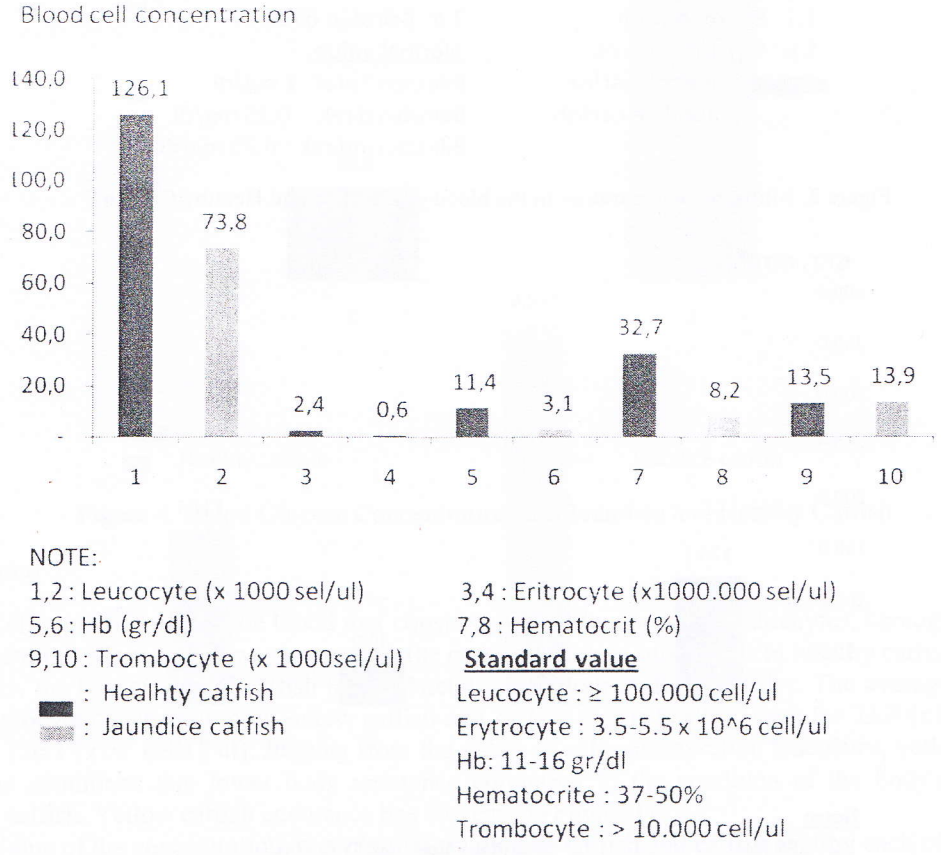

Figure 1. Concentration cells in the blood of catfish (*Clarias gariepinus*) jaundice and healthy.

The results of measurements of the concentration of bilirubin, which consists of total bilirubin, direct bilirubin and indirect bilirubin are presented in Figure 2. Seen from Figure 2 is that the concentration of bilirubin in the catfish, yellow catfish is higher than the standard healthy and bilirubin values.

Figure 2 shows that the value of total bilirubin in yellow catfish reach 7 to 8 times greater than standard bilirubin. Similarly, direct concentration in the blood of yellow catfish reach 16 times orders of magnitude larger than the standard value. In contrast, the blood of healthy catfish contain total and

indirect bilirubin with normal concentrations. However, the concentration of direct bilirubin in the blood of healthy catfish higher than the standard concentration.

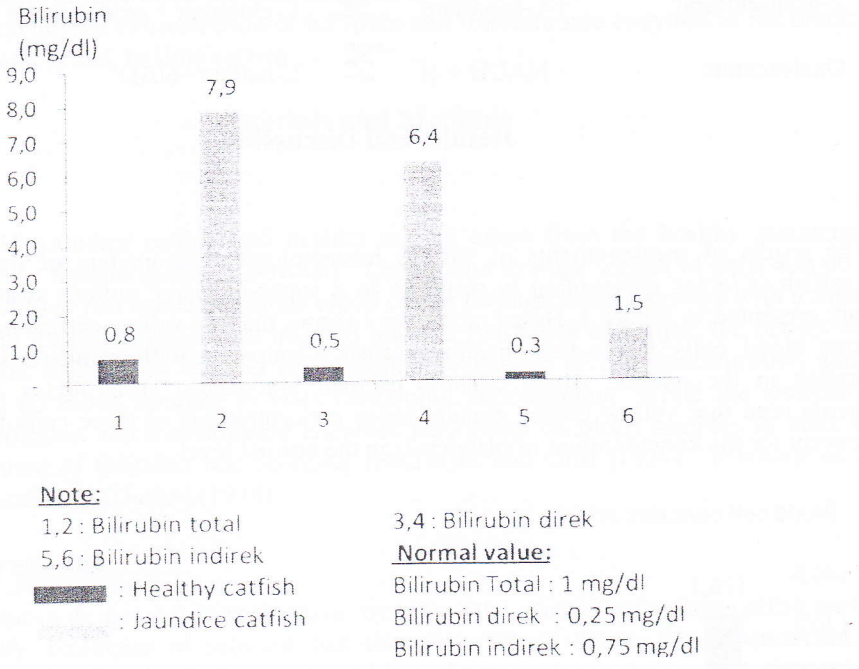

Figure 2. Bilirubin concentration in the blood of Jaundice and Healthy Catfish.

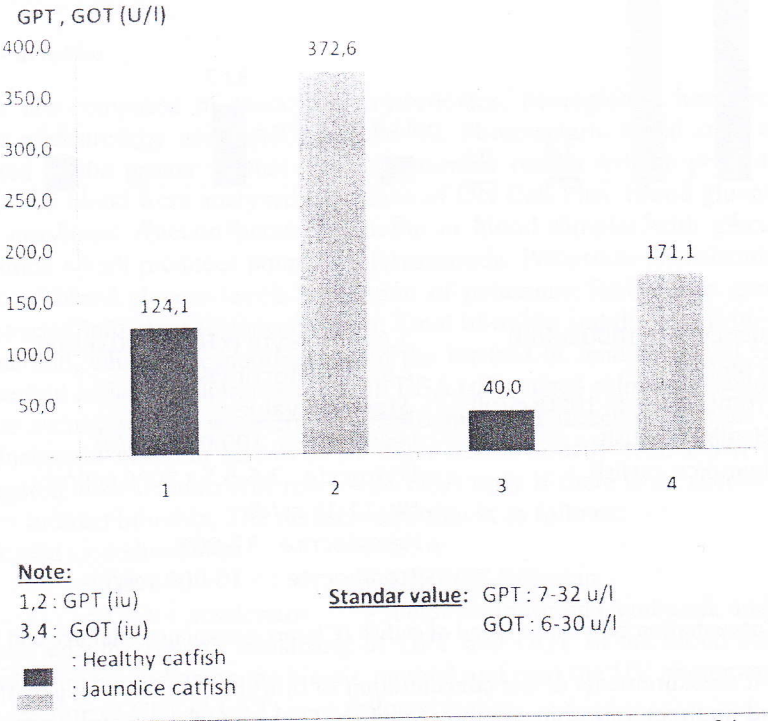

Figure 3. Concentration of enzyme transaminase (GPT and GOT) in blood serum of jaundice and healthy catfish.

In blood serum catfish and yellow catfish contain healthy transaminase enzyme, which consists of GPT and GOT concentrations greater than the standard value (Figure 3). Yellow catfish blood serum containing the enzyme GPT concentrations of 11 to 12 times higher than the standard value.

While the apparently healthy fish containing GPT in the blood serum is 3-4 times higher than the standard value. GOT concentration contained in the blood serum and catfish, yellow catfish healthy individual reaches 5-6 times and 2-3 times higher than the standard value.

Jaundice catfish containing glucose in the blood with a higher concentration of blood glucose concentration healthy catfish (Figure 4). The average value of the concentration of glucose in the blood of yellow catfish and catfish healthy each of 201.6 and 50.6 mg / dl. The value of blood glucose concentration is instantaneous. Fish samples taken from fish populations do not consume food for 4 days.

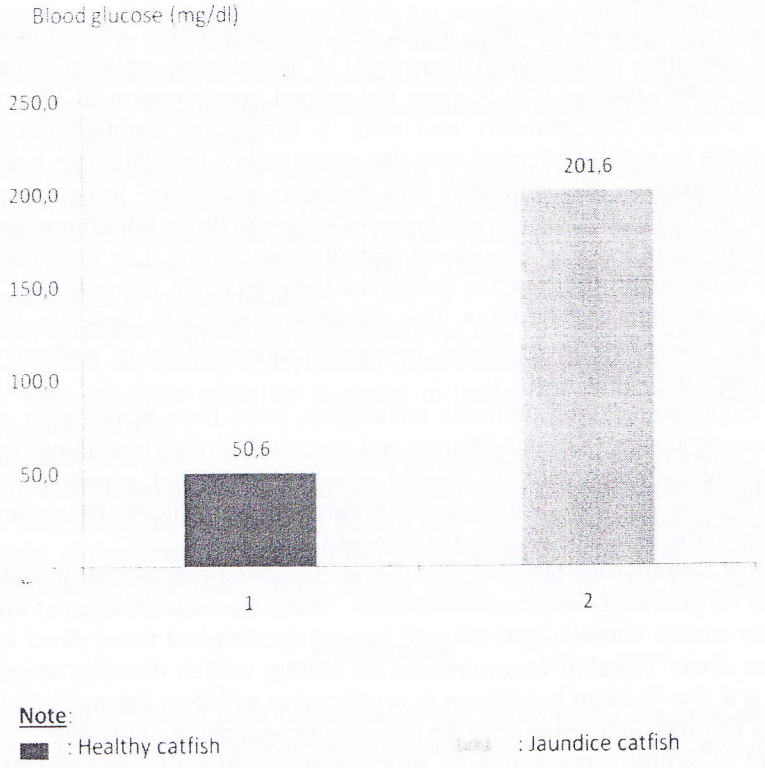

Figure 4. Blood Glucose Concentration and Jaundice and Healthy Catfish

Discussion

Cell concentration in the blood that consists of total leucocytes, erythrocytes, hemoglobin, and hematocrit in yellow catfish was lower than the concentration of blood cells in healthy catfish (Fig. 1). However, the two groups of catfish has a platelet concentration did not differ. The average value of total leukocyte concentration of yellow catfish and catfish that is healthy, each for 73.8 ($x10^3$ cells / ul) and 126.1 ($x10^3$ cells / ul). Judging from the value of cell concentration leucosites, yellow catfish have the conditions that lower body resistance compared to the condition of the body's defenses healthy catfish. Yellow catfish endurance has decreased (Figure 1).

Value of the concentration of erythrocytes jaundice catfish and catfish healthy each of 0.6 Z 10^6 cells / ul and 2.4 x 10^6 cells / ul. Catfish erythrocytes standard value is 3.5 - 5.5 x 10^6 cells / ul. When associated with the concentration of direct bilirubin yellow catfish and catfish are bigger healthier than the standard value of direct bilirubin, then this condition shows that the yellow catfish and catfish healthy experience hemolysis or breakdown of hemoglobin in the erythrocyte cell growth. But if it is associated with hemoglobin values, it appears that jaundice catfish showed hemolysis condition is reinforced by the low value of hemoglobin in yellow catfish, the which amounted to 3.1 g / dl. Values of healthy catfish hemoglobin 11.4 g /dl is still in the normal category According to the standard (11.0-16.0 g / dl). The same thing Happens to hematocrit values, the hematocrit value of less than the yellow catfish catfish healthy hematocrit values (Fig. 1). The average hematocrit value of the yellow catfish and catfish healthy respectively of 8.2% and 32.7%. Into two groups of fish that contain lower

hematocrit values than the standard hematocrit value of catfish (37-50%). Catfish blood hematocrit percentage reflects the proportion of erythrocytes in the blood. Hematocrit percentage value describes the size of the concentration of erythrocytes in the blood and can also describe the size of the erythrocyte cell.

Describe the performance of haematological fish fish health condition (Jhonny et al., 2003). Data measured concentrations of a variety of catfish blood cells showed that the health condition of yellow catfish has decreased. Health condition is thought to be related to the condition of mal liver function. damage condition or abnormalities in liver cells that cause fish to become yellow or hiperbilirubin and also the increase of transaminase enzymes consisting of SGPT and SGOT in the blood serum of fish (Figure 3).

Yellow catfish contain total bilirubin, direct, and indirect bilirubin with a higher concentration of healthy catfish bilirubin concentration (Figure 2). Concentration of total bilirubin and direct bilirubin in yellow catfish reaches 6 to 9 times the normal concentration of bilirubin / standards, whereas indirect bilirubin concentration was only 2 times the standard concentration. This phenomenon illustrates hyperbilirubin conditions that cause yellow fish. Bilirubin is a yellow pigment produced from the breakdown of hemoglobin (Hb). Bilirubin is excreted in the bile and excreted in the feces and urine. In the blood, there are two forms of bilirubin, direct bilirubin is dissolved in water and indirect bilirubin, the bilirubin is conjugated with albumin. There is an increasing concentration of direct bilirubin in the blood illustrate the imbalance between haem into bilirubin and solving the liver's ability to make a conjugated bilirubin. This condition is probably caused by liver malfunction or breakdown of red blood cells is excessive. Increased concentrations of indirect bilirubin in the blood indicates damage to the bile duct.

According Vaghbijiani (2008), bilirubin metabolism starts from hemoglobin contained in red blood cells (erythrocytes) which have the solution and generate bilirubin unkonjugasi and is dissolved in water. Furthermore, bilirubin will be entered into the heart and experience the process of conjugation with albumin. Through the bile ducts, bilirubin be secreted into the gastrointestinal tract. Bilirubin is excreted in the feces and urine in the form of Urobilinogen.

Healthy catfish contain total bilirubin with lower concentrations of total bilirubin value of the standard, as well as its indirect bilirubin concentrations. While the concentration of direct bilirubin in the blood of healthy catfish Urobilinogen increase beyond the standard value direct bilirubin (Figure 2). The increase in direct bilirubin concentrations in healthy catfish describe several possibilities, namely that there is a rise in haem breakdown in erythrocytes and liver damage cell function so that direct bilirubin will be difficult to experience the process of conjugation in the liver.

Measurement of serum concentration of bilirubin in the blood of yellow catfish and catfish samples taken from healthy catfish from the pond system maintenance with the same or similar populations. Figure 2 shows that the yellow catfish and catfish contain unhealthy concentrations of direct bilirubin greater than standard direct bilirubin. Therefore, it is alleged that the two groups of catfish are damaged liver function. However, a yellow catfish liver malfunction with a higher level compared to liver damage in healthy catfish. Yellow catfish are also seen damaged bile duct (Figure 2). Mal condition of damage or liver function may also be seen from the data of serum transaminase enzyme activity (Figure 3).

Figure 3 shows that the yellow catfish and catfish have healthy transaminase enzyme activity in the blood is greater than the standard value. The increase in transaminase enzyme activity in blood showed liver damage (Hughes, 2008). According to Hughes (2008), the enzyme transaminase, both GOT (glutamate oxaloasetat transaminase) and GPT (glutamate pyruvat transaminase), is an enzyme derived from the liver cells. If the liver cell is damaged it will result in an increase in serum enzyme levels. Value of enzyme activity in serum transaminase yellow catfish is 372.6 u / L for alanine aminotransferase and 171.1 u / l for AST. While the default values for SGPT and SGOT, each for 7-32 u / l and 6-30 u / l (Figure 3). Value of transaminase enzyme activity in serum of healthy catfish 124.2 u / l and 40.0 u / l respectively for SGPT and SGOT. Based on data SGPT and SGOT are it can be concluded that the yellow catfish and catfish are kept healthy with super-intensive system showed liver damage. Liver damage condition Yellow catfish looks more serious than a damaged condition catfish healthy liver function. Yellow catfish are also showing a good increase in total bilirubin, direct or indirect, which means that the yellow catfish were also damaged bile ducts.

Fish liver is the organ that is essential in maintaining health and functioning (Holt and Smith, 2008). Hepatocyte is composed of about 80% of all liver cells that act as a functional liver. These cells have a variety of roles, including drug metabolism, protein synthesis, secretion of clotting factors, and the storage of sugar in the form of glycogen. Bile is a product of the liver cell which consists of several components, namely bilirubin and bile acids. Bile is concentrated and stored in the gall bladder. Bile is secreted into the digestive tract when needed. Bile serves to fat emulsionfier. Vaghjiani (2008) adds that the level of liver function as a regulator of amino acids in the blood by forming building blocks of proteins. Liver also functions in converting toxic ammonia into urea; synthesize and metabolism of cholesterol, phospholipids, triglycerides and lipoprotein; produces bile, which helps carry waste and the breakdown of fat in the intestine during digestion. Fat and fat-soluble vitamins (vitamins A, D, E, K) require bile in the absorption. Liver function in the conjugate and excrete bilirubin. Another function of the liver was inactivates hormones, metabolism and excretion of drugs and toxins, the body's defense against infection through the production of immune factors and removing bacteria from the bloodstream.

If viewed from the blood glucose concentration, it appears that yellow catfish contain glucose in their blood with a higher concentration of healthy catfish. Blood glucose concentration of catfish and catfish healthy yellow, each for 201.6 mg / dl and 50.6 mg / dl. An increase in blood glucose concentration can indicate stress (Hastuti, et al, 2003). Therefore, high blood glucose concentrations in yellow catfish, presumably due to stress.

Stress causes catfish to regulate its influence over the performance of the liver in regulating energy homeostasis (Holt and Smith, 2008). Stress conditions that cause the heart continuously works hard to regulate. This condition could be expected to lead to other liver dysfunction resulting in hyperbilirubin in yellow catfish.

When associated with a system of cultivation practiced in the village Boyolali catfish, which is a very high density or 300-500 fish/m^2, it is suspected that the condition of the density of fish is also a trigger of stress. According Subandiyono and Hastuti (2008a, b), the optimum density for catfish is at 200 fish/m2. Density of more than 200 catfish fish/m2 asymptomatic average size of fish smaller and showed lower resistance. High fish density causes social stress on the fish so that fish growth impaired.

Conclusion

The conclusion to be drawn from the results of this study is that the concentration of various cells in the blood of yellow catfish is lower than the concentration of blood cells in healthy catfish, except for platelets. Platelets are the blood contained in healthy catfish and yellow are within normal limits. Yellow catfish showed hiperbilirubin conditions, but the yellow catfish and catfish have healthy transamine enzyme activity in blood serum of the same height.

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PROGRAM OF ICAI 2012

THURSDAY, NOVEMBER 22		
13:00 – 20:00	**Registration Open** & Exhibit Set-up Submission of files for oral presentations, Poster Set-up, Check In Hotel	
20:00 – 21:30	MAI Member/Board Meeting 2012	
FRIDAY, NOVEMBER 23		
07:00 – 12:00	**Registration Open**	08:30 – 17:30 Exhibition / Poster Open
08:00 – 09:30	**Plenary Session (Lecture I)** : • Current Issues and Development of Sustainable Global Aquaculture Production and Business (**Roy D. Palmer**, FAICD; Past President WAS-APC/Australia Business Development Manager – GAA/BAP) • Revitalization Project of Shrimp Farming in Indonesia (**Dr. Slamet Soebjakto**, Director General of Aquaculture, Ministry of Marine and Fisheries Affairs)	
09:30 – 09:45	**Coffee Break** (Provided)	
09:45 – 10:40	**Welcome Speech**: **Prof Rohmin Dahuri**, President IAS **Signing MOU** : GAA and IAS **Signing MOU**: Directorat General of Aquaculture and IAS **Presenting MAI Award 2012** **Opening Ceremony and Keynote Speech**: *"Strengthen and Speed Up Sustainable Aquatic Food Production Through Aquaculture Industrialization"* Minister for Marine and Fisheries Affairs of Indonesia, **Mr. Sharif C. Sutardjo** **Inauguration of IAS Board Period 2011-2015** **Inauguration of Sibusido**	
10:40 – 11:45	**Plenary Session (Lecture II)** : • Advanced genomics : Indonesian breeding – leading the world in shrimp genetics (**Dr. Dean Jerry**, James Cook University, Queensland - Australia)	Moderator: Dr. Bambang Widigdo
12:00 – 13:20	**Lunch Break** (Provided) **(Poster sessions)**	
	Presentation of Selected Papers	
13:20 – 17:00	• Food Safety and Sustainable Aquaculture Class	
13:20 – 17:00	• Innovations in Aquaculture Technology Class	
13:20 – 17:00	• Feed Management and Development Class	
13:20 – 17:00	• Aquaculture Management and Business Class	
15:20 – 15:40	**Coffee Break** (Provided)	
19:00 – 21:30	President's Reception/Gala Dinner (optional)	

SATURDAY, NOVEMBER 24		
07:00 – 10:00	**Registration Open**	
08:00 – 10:20	**Plenary Session (Lecture III)** : • Global Climate Change Impact On Seafood Production (Fishery & Aquaculture): How should we do? (President of the Indonesian Aquaculture Society (IAS), **Prof. Rokhmin Dahuri**) • Prospect and Current Market For Aquaculture in Indonesia & Global (**Mr. Thomas Darmawan**, President AP5I) • Disease Management Practices In Shrimp Farming: Problem Solving for Sustainable Global Shrimp Aquaculture (**Dr. Nyan Taw**, Blue Archipelago, Malaysia) • Feed Management and Development for Sustainable Aquaculture (**Prof. Shunsuke Koshio**, Kagoshima University, Japan)	Moderator: Dr Agung Sudaryono
10:20 – 10:40	**Coffee Break** (Provided)	08:30 – 15:00 Exhibition Open
	Presentation of Selected Papers	
10:40 – 12:40	• Food Safety and Sustainability Aquaculture Class	
10:40 – 12:40	• Innovations in Aquaculture Technology Class A	
10:40 – 12:40	• Innovations in Aquaculture Technology Class B	
12:40 – 13:20	**Lunch Break** (Provided)	
13:20 – 15:50	**Shrimp Aquaculture Overview (Lecture IV)** • Current Status of Shrimp Farming Development in Indonesia (**Dr. Bambang Widigdo**, Indonesian Aquaculture Society/KUI) • Global Shrimp Aquaculture Outlook 2012 (**Roy D Palmer**, WAS/GAA) • Do Probiotics Work Effectively In Shrimp Ponds?: A Proven Research (**Dr. Nyan Taw**, Blue Archipelago, Malaysia)	Moderator: Prof. Rokhmin Dahuri
15:50 – 16:00	**Closing Remark**: **Prof. Rokhmin Dahuri**, President IAS	
16:00 – 16:15	**Coffee Break**	

PARALEL SESSION

Food Safety and Sustainability Aquaculture Class

Friday, November 23, 2012 (First session of Parallel Class)

Moderator: **Dr. Sapto P. Putro**; Room: **Muria Room**

13:20–13:40	The Richness of Bacteria Associated With Bacterial Diseases on the Giant Gouramy (*Osphronemos gouramy*) (**Sarjito,** Diponegoro University)
13:40-14:00	The Occurence of White Spot Synmdrome Virus (WSSV) Disease on Tiger Shrimp (*Penaeus monodon*) in Nort Coast of West Java, Indonesia (**Rohita Sari**, Diponegoro University)
14:00-14:20	Discovery of Traceability and Sustainability Aspects of Fish Meal and Fish Oil on Shrimp Aquafeed Industry in Indonesia (**Agung Sudaryono**, Diponegoro University)
14:20-14:40	An Integrated Biotechnology-Based Disease Prevention Strategy Involving Immunostimulants, Antivirals and Multiplex PCR (**Ung Eng Huan,** BioValence Sdn.Bhd)
14:40:15:40	*Refreshment break*

Moderator: **Dr. Sardjito**; Room: **Muria Room**

15:40–16:00	The Probiotics Application on *Scylla olivacea* Larvae Reared in Laboratory (**Gunarto,** BPPBAP Maros)
16:00-16:20	Tiger Shrimp Culture in Indonesia Using Local Probiotic Bacteria (**Muharijadi Atmomarsono**, BPPBAP Maros)
16:20-16:40	Immunomodulating Activity of Fucoidan, *Padina* sp. in Tilapia (**Alim Isnansetyo,** University of Gadjah Mada)

Saturday, November 24, 2012 (Third session of Parallel Class)

Moderator: **Dr. Sardjito**; Room: **Eureka Room**

10:40-11:00	Development of an Environmental Friendly feeding Management for Giant Gouramy (*Osphronemus gouramy* Lac.) to Improve Aquaculture Sustainablity (**Edy Yuwono**, University of General Soedirman)
11:00-11:20	Biomonitoring of Environmental Quality of Fish Farming Practice at Lake Rawapening, Central Java Based on Macrobenthic Assembalges (**Sapto Purnomo Putro**, Diponegoro University)
11:20-11:40	Sustainable Seafood Production : Malaysian Status With the World Comparison (**Md. Arif Chowdhury**, Universiti Sains Malaysia)

Innovation in Aquaculture Technology Class

Friday, November 23, 2012 (First session of Parallel Class)

Moderator: **Dr. Alim Isnansetyo** ; Room: **Merapi I Room**

13:20–13:40	Utilization of *Gracillaria* Sp. as Biofilter on The Nursery of Barramundi (*Lates calcarifer* Bloch) in Silvofishery Pond (**Rose Dewi/Tjahjo Winanto,** University of General Soedirman)
13:40-14:00	Cultivation of Kepah Clam *Polymesoda erosa* (Solander, 1786) on Mangrove Ponds and Mangrove Ponds Without in Mahakam Delta East Kalimantan Province (**Samsul Rizal**, Mulawarman University)

14:00-14:20 Performance Evaluation of Biofilter in Recirculating Integrated Multi-Trophic Aquaculture (**Sumoharjo**, Mulawarman University)

14:20-14:40 Specific Primer Construction for Transferrin Gene of Indonesian Nile Tilapia for Seawater Aquaculture (**Irvan Faizal**, BPPT)

14:40:15:00 Microbial Diversity Associated With Scleractinian Corals, Galaxeafascicularis and Stylophorapistilla: The Impact of Light Intensity (**Khamsiah Ahmad**, University of Khairun Ternate)

15:00-15:40 ***Refreshment break***

Moderator: **Dr. Rita Rostika** ; Room: **Merapi I Room**

15:40-16:00 Genetic Diversity of Tropical Abalone *Haliotis asinina* l. in South Sulawesi Indonesia: Challenge for Aquaculture (**Magdalena Litaay**, University of Hasanuddin)

16:00-16:20 Seaweed Bioethanol Potential from Southern Coast of Central Java : A Challenge for Seaweed Aquaculture (**Maria Dyah Nur Meinita,** University of General Soedirman)

CLASS : A

Saturday, November 24, 2012 (Second session of Parallel Class)

Moderator: **Dr. Rita Rostika** ; Room: **Merapi Room**

10:20-10:40 Study of Thyroxine Hormone in The Reproducing Females of the Mud Crab (**Heppi Iromo**, Borneo University)

10:40-11:00 Haematological Performances of Jaundice Catfish (*Clarias gariepinus*, Burch.) (**Subandiono**, Diponegoro University)

11:00-11:20 Genetic Performance of Eight Strains of Cultured Nile Tilapia (*Oreochromis niloticus*) in Indonesia Evaluated by Using Microsatellite DNA Marker (**Wahyu Kusuma**, University of Brawijaya)

11:20-11:40 The Genitic Diversity of Megalocystivirus from Indonesian Marine Fishes (**Murwantoko**, University of Gadjah Mada)

CLASS: B

Saturday, November 24, 2012 (Second session of Parallel Class)

Moderator: **Khamsiah Ahmad, S.Pi., MP., M.Sc** ; Room: **Muria Room**

10:20-10:40 Specificity Haemolysin Gene Markers from Local Isolates for Rapid Detection of Vibriosis (**Ince Ayu Khairana Kadriyah**, Research Institute for Coastal Aquaculture)

10:40-11:00 Effect Of Local Macroalgae On Feed Consumption, Growth, And Survival Rates Of Abalone (*Haliotis Squamata*) Reared In Floating Pastic Cages In Kuanheun Waters (**Ricky Gimin**,, University Of Nusa Cendana)

11:00-11:20 Comparison of Nitrification Efficiencies of Sand, Polystyrene Microbead and Kaldnes Biofilter Media (**Dicky Harwanto,** Diponegoro University)

11:20-11:40 Transfer of Gene Encoding Tilapia Growth Hormone (TIGH) in Catfish (*Clarias* sp.) by Microinjection Method and Electroporation Method (**Gusrina**, VEDCA Cianjur)

11:40-12:00 Effect of Transport Techniques on Survival and Weight Loss in Juvenile Abalone, *Haliotis squamata* (**Ricky Gimin**, University Of Nusa Cendana)

Feed Management and Development Class

Friday, November 23, 2012 (First session of Parallel Class)

Moderator: **Ir. Dedy Yaniharto, M.Sc.** ; Room: **Eureka Room**

13:20–13:40 Optimizing Noni Leaf Silage (*Morinda citrifolia* Linn.) in Feed to the Performance of Eelaes Hematologic *(Anguilla bicolor)* Infected by Bacteri *Aeromonas hydrophilla* (**Mivida Febrani**, University of Hang Tuah)

13:40-14:00 Amino Acid Composition Abalone *Haliotis asinina* Meat Fed Formulated and Natural Diet (**Andi Besse Patadjai**, University of Haluoleo)

14:00-14:20 Enhance Immune System of Pacific White Shrimp (*Litopenaeus vannamei*) During Ammonia Stress by Protein Hydrolysate from Poultry by-Product (*Litopenaeus vannamei)* (**Orapint Jintasataporn**, Kasetsart Univ.)

14:20-14:40 Substitution of Detoxified *Jatropha curcas* Kernel Meal for Soybean Meal: Effect on Growth Performance, Enzyme Activity and Immune Response in Nile Tilapia *Oreochromis niloticus* (**Riza Rahman Hakim**, Kasetsaart University)

14:40-15:00 Fatty Acid Profile of the Red Alga *Kappaphycus alvarezii* (Doty) Doty (**M. Ikbal Illijas**, Agriculture State Polytechnic of Pangkep)

15:00-15:40 ***Refreshment break***

Moderator: **Ir. Dedy Yaniharto, M.Sc.** ; Room: **Eureka Room**

15:40-16:00 Rearing of *Anguilla bicolor* Elver With Different Density and Types of Feed (**Purnama Sukardi**, University of General Soedirman)

16:00-16:20 Effect Of Protein Hydrolysate From Eri Silkworm (*Philosamia ricini,* Boisd) on hybrid catfish (*Clarias macrocephalus* X *Clarias gariepinus*) Productive Performance (**Orapint Jintasataporn**, Kasetsart University)

Aquaculture Management and Business Class

Friday, November 23, 2012 (First session of Parallel Class)
Moderator: **Dicky Harwanto, Ph.D** ; Room: **Merapi II Room**

13:20–13:40 Feasibility Optimization to Business of Nile Tilapia (*Oreochromis niloticus*) in Cages in Kutai Kartanegara Regency (**Heru Susilo**, Mulawarman University)

13:40-14:00 Shrimp Pond Environmental Quality Improvement and Tiger Shrimp (*Penaeus monodon*) Production Increment through Better Management Practices (BMP) for Traditional Shrimp Aquaculture Application in Tarakan, East Kalimantan (**Muhammad Budi Santosa**, Indonesian WWF)

14:00-14:20 Quality of Red Alga *Kappaphycus alvarezii* in Relation to an Application of the Health Seaweed Certificate (**Petrus A. Wenno**, University of Pattimura)

14:20-14:40 The Bulungan Kalo Giant Gourami (*Osphronemus septemfasciatus*) as Potential Fish For Food and Aquarium Hobbies (**Syaiful Herman**, BAPPEDA Kab. Bulungan Kalimantan Timur)

14:40-15:00 The Application of Better Management Practices (BMP) Tilapia (*Oreochromis niloticus*) Aquaculture by Small Scale Farmers, Case Study : Toba Lake, North Sumatra (**Wahju Subachri**, Indonesian WWF)

15:00-15: 40 ***Refreshment break***

Moderator: **Dicky Harwanto, Ph.D**; Room: **Merapi II Room**

15:40-16:00 Catfish, *Pangasius* sp., Aquaculture Development in Minapolitan Area of Banjar Regency South Kalimantan Provinsi: Site Selection Analysis (**I Nyoman Radiarta**, Puslitbang Perikanan Budidaya)

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