



## ISOLATION AND CHARACTERIZATION OF DIGESTIVE DUMBO CATFISH (*CLARIAS GARIEPINUS*) AS A PROBIOTIC CANDIDATE

\*Dr. Widya Anggrayesti, Periadnadi and Nurmiati

Biology Departement, Faculty of Mathematic and Natural Sciences, Andalas University, Padang, Indonesia.

\*Corresponding Author: Dr. Widya Anggrayesti

Biology Departement, Faculty of Mathematic and Natural Sciences, Andalas University, Padang, Indonesia.

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### ABSTRACT

Indigenous bacteria (natural bacteria) in the digestive tract of fish have more influence which helps digestion of nutrients and secrete digestive enzymes. This study aimed to isolate and selecting potentially probiotic bacteria in the digestive tract of African catfish. Selection of candidate probiotics include maksroskopik, microscopic, biochemical and pathogenicity test. The result showed 1 isolates potensif as probiotics with characteristic rounded shape of the colony, the colony edges average, average elevation, color white colonies, basil cell shape, a Gram-positive bacterium, motile, catalase negative, has an index of 2.8 and test degradative negative pathogens. From these tests grouped the isolates classified into *Lactobacillus* sp.

**KEYWORD:** Isolation, Probiotik, *Lactobacillus* sp.

### PRELIMINARY

Fish is a food source of protein which is high compared to some other agricultural products. One type of fish widely consumed commodity farming community is Dumbo Catfish (*Clarias gariepinus*). Catfish Dumbo is one type of freshwater fish commercially popular as fish farming and animal protein to meet the needs for the community. Department of Marine and Fisheries (2008) stated the advantages of maintenance Catfish which have properties resistant to the environment is relatively poor so that it can be maintained intensively in high density. And can be maintained with limited space (save land) in the marginal area of water saving. This fishery commodities easily cultivated and has a growing interest and relatively fast growth. problems faced by farmers is the price of feed (pellets) fish are relatively expensive so that farming activities Catfish require a large cost in the procurement of feed. The cost of feed is caused mostly imported raw materials and fish feed prices continue to rise sharply. The problems led to many farmers who suffered losses. For that, we need an alternative way to improve and support the growth of Catfish with minimal cost. Feed in aquaculture generally a commercial feed spends about 60-70% of total production costs incurred. This is why the importance of the quality of the feed so that research must be done to improve the nutritional value of feed that can be done with the addition of probiotics.

Probiotics are food additives (supplements) in the form of living microbial cells for the host animal by improving

the intestinal microbial balance fine. The use of probiotics in fish farming aims to maintain the balance of microbes and suppress pathogenic activity in the digestive tract (Irianto, 2007). Some types of bacteria found in the digestive tract of animals has an important role in order to improve feed utilization, fish health (Feliatra, 2004). In addition, some natural bacteria in the digestive tract has an important role and produces several types of enzymes in the digestive tract that play a role in metabolism. Pelczar and Chan (1988) suggest that the original bacterial digestive tract has a mutualism relationship with its host, which utilize host as a place of life. Benefits for the host which helps digestion of nutrients. As well as the presence of naturally occurring bacteria tend to suppress the growth of pathogenic bacteria so that it can protect the host against disease and stimulate the immune function. There are several characteristics that must be considered to determine a potential to become a microbial probiotic cultures. According to Shortt (1999) are some criteria to consider to get the probiotic with optimal positive impact to its host is a species of probiotic bacteria are normal intestinal microflora. Because the bacteria can more easily adapt to the intestinal environment, not pathogenic, have the ability to attach to and colonize the intestinal cells, able to live and survive in fish digestion. Then in the selection of fish that will be used as a probiotic candidates must qualify that fish have to be healthy. According Saparinto (2009), which are categorized as healthy fish ie no parasites, no pathogenic bacteria (which attacks the abdomen, chest, and the base

siripdan absence of bleeding), and no fungus that attacks the injured skin. Several studies on the use of probiotics which have been carried out by several studies that have been done, including by Camu *et al.*, (2007) that get results that probiotics as nutritional components that contain strains of bacteria capable of producing lactic acid and acetic acid in the gut so it can suppress the growth bacterial pathogens. Ahmadi *et al.*, (2012) where the use of probiotics in feed catfish generate daily growth rate and feed efficiency high of 3.12% and 3.15% and without the addition of probiotics by 2.04%, then Edelweiss (2013) states that the benefits of probiotics as an additive in feed growth in grouper duck on future enlargement. Arif *et al.*, (2014) stated probiotics in commercial feed affect the growth rate and feed efficiency of fish catfish.

## MATERIALS AND METODS

Research uses experimental method to the presence of naturally occurring bacteria digestion Catfish, characteristics, potential in vitro isolates potensif digestive catfish as a candidate probiotic. This reasech was conductwd from oktober 2015 until mei 2016, microbiology laboratory, andalas university.

The tools needed in this study : testube, petridish, rack test tubes, beakers , erlenmeyer , plastic wrap, flask, test tube rack, rod stirrer, micro pipette, a pipette, needle ose, lights spritus, autoclave, vortex, incubator 37o Celsius, hot plate The materials used such as the gastrointestinal tract of catfish, medium order Starch Rice (APB), medium Carboxy Methyl Cellulose Agar (CMC Agar) , medium Skim Milk Agar (SMA), Glucose Peptone order + Calcium carbonate (GPA + CaCO3), medium NA semisolid.

### Selection of bacteria

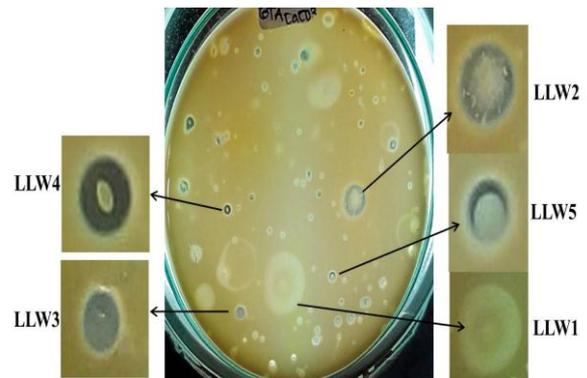
The digestive tract of African catfish fish were weighed and measured length is then crushed and diluted . 1 gram

digestion catfish dicukupkan with 10 mL of normal saline NaCl 9 % . Grown into media Peptone Glucose + CaCO3

### isolation of bacteria

This test aims to be selective digestive natural isolates of African catfish potentially probiotic to test the characteristics of a maksroskopik , microscopic , biokima and pathogen testing with Blood agar

## RESULTS AND DISCUSSION



Bacterial isolates Potensif Natural Gastrointestinal Dumbo Catfish

Insulation planted on media GPA + CaCO3, bacterial growth by showing the clear zone around bacterial colonies, detected and suspected as lactic acid - producing bacteria because it can transform sugar into asam. Bakteri isolated by taking a single bacterium then grown again until seragam.dengan obtained colony isolates code LLW1, LLW2, LLW3, LLW4, and LLW5. With five isolates taken from the same source with a large halo zone and a different colony, which in turn will be the basis for guidelines and look at the character and potential.

**Table 1: From the test characteristics of 3 isolates obtained as a 2 isolates of gram series of tests that isolate LLW 4 classified into bacterial isolates.**

Character	LLW 1	LLW 2	LLW 3	LLW 4	LLW 5
<b>Macroscopic</b>					
<b>a. Forms colonies</b>	Circular	Circular	Circular	Circular	Circular
<b>b Margins colony</b>	Entire	Entire	Entire	Entire	Entire
<b>c . elevation colony</b>	Raised	Raised	Flat	Flat	Flat
<b>d colony color</b>	white	white	white	white	white
<b>2. Microscopic</b>					
<b>a. cell shape</b>	Basil	Basil	Basil	Basil	Basil
<b>b . Motility</b>	Motil	Motil	Motil	Motil	Motil
<b>c . Gram</b>	-	+	-	+	+
<b>3. catalase test</b>	+	+	+	-	-
<b>4. degradative Index</b>	1,9	1,6	1,1	2,8	1,5



Isolate LLW4 has the ability to lysis of the highest protein measured by the value of proteolytic Index (3.0), fermentation (2.0), cellulolitic (1.3) and amylolytic (1.2). LLW4 bacterium is a Gram positive, motile and have the characteristic macroscopic warana white colonies with colony edges average. Based on various tests of characteristics, morphology, biochemistry were observed based on the book Bergey's Manual of Systematic Bacteryologi suspected bacterial isolates LLW4 categorized into the genus *Lactobacillus* sp. (Appendix 3). Isolates LLW4 selected as the best isolates potentially after several trials and has the highest proteolytic index, which further isolates LLW4 can be used as probiotics in feed products.

The same research Feliatra et al., (2004), that the bacteria genus *Lactobacillus* approaching sp. Have morphological characteristics as colony color milky white or yellowish-white, round or oval form colonies or large round, a Gram-positive, motile or not motile. The bacteria in the digestive tract of aquatic animals are known to have such a good role genus *Bacillus*, *Bifidobacteri*, *Pseudomonas*, *Lactobacillus* and *Mikrococcus* been proven as beneficial bacteria and can live as normal flora associated organisms both inside and outside the body.

Ray (1996) cit Husmaini (2012) states that *Lactobacillus* one genus of lactic acid bacteria are most often found in the gastro-intestinal in both humans and animals and in the small intestine Setiawati et al., (2013) also add *Lactobacillus* bacteria is one of fermentation microorganisms, which when present in food or feed ingredients to make improvements so that it can improve the quality of feed digestibility which in turn can boost growth. Probiotics as agents of decomposition in the application of fisheries in the world can be used directly or with dispersed into the water through the intermediary of food. Of the total microbial isolates LLW 4 as a candidate probiotic will then be applied to the fish feed by spraying. *Lactobacillus* bacteria which is one type of

good bacteria that are used as probiotics. Then the test is negative LLW4 pathogenic isolates of pathogens, it indicates that the isolate LLW4 not toxic. Shortt (1999) cit Yusra (2015) suggests several criteria that need to be considered to get probiotics to influence optimal for the host is a species of probiotic bacteria are normal microflora intestine so that the bacteria can more easily adapt to the intestinal environment, not pathogenic, Has ability to attach to and colonize the intestinal cells, shown to have beneficial effects on health.

## CONCLUSION

Isolates LLW4 a potentially probiotic isolates, Gram-positive, motile, catalase negative, KOH test positive, negative pathogens and bacteria classified as *Lactobacillus* sp. Test the pathogenicity of the five isolates were obtained 3 isloat (LLW1, LLW2 and LLW4) negative pathogens. LLW3 and LLW5 positive pathogens.

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