

# *Effect Of Gynura Procumbens Powder Dosage On Feed For Pangasius SP Infected With Aeromonas Hydrophyla Bacteria*

Elfrida<sup>1</sup>, Nawir Muhar<sup>1</sup>, Abdullah Munzir<sup>1</sup>, Amelia Sriwahyuni Lubis<sup>2</sup>

<sup>1</sup>Department of Aquaculture, Faculty of Fisheries and Marine Science, Bung Hatta University

<sup>2</sup>Department of Biology, Faculty of Mathematics and Natural Science, Andalas University



**Abstract** – This study aimed to analyze the effect of giving *Gynura procumbens* with different doses on feed for *Pangasius sp* infected by *Aeromonas hydrophyla* bacteria. The research method used in this study was an experimental method with a completely randomized design (CRD) with 4 treatments and 3 replications. The treatment in this study was feed without the administration of *Gynura procumbens* leaf powder (control/A1); feed + 50 grams of *Gynura procumbens* leaf powder/100 grams of feed, (A2); Pellet feed + 60 gr of *Gynura procumbens* leaf powder / 100 gr of feed (A3), pellet feed + 70 gr of *Gynura procumbens* Leaf powder / 100 gr (A4). The clinical symptoms observed during the observation were behavior including feeding response, movement reflexes, and physical injuries. clinical symptom testing and water quality were analyzed descriptively, while survival and wound coverage data used analysis of variance to see the effect of treatment on test parameters. The results showed that the best dose for wound healing due to *Aeromonas hydrophyla* bacterial infection in catfish using *Gynura procumbens* leaf powder was treatment D (70 gr / 100 gr feed) with wound shrinkage of 61.51% and the survival rate during the study was around 66.67%. - 100%.

**Keywords** – *Gynura procumbens*; *Pangasius sp*; *Aeromonas hydrophyla*

## I. INTRODUCTION

Catfish (*Pangasius sp.*) is one of the fish in Indonesian waters that have been successfully domesticated and cultivated semi-intensively and intensively with high stocking densities and minimal water use. Patin is a type of freshwater fish native to Indonesia in parts of Sumatra and Kalimantan<sup>[1]</sup>. Catfish have the advantage of having a delicious and tasty meat taste, large size, fast growth, and easy cultivation. Increasing the stocking density of fish with an increase in the amount of feed given and uncontrolled water quality will cause a decrease in fish growth. If it has reached a specific limit then its growth will stop completely. One of the factors that affect fish growth is environmental conditions, especially water quality. Decreased water quality can cause fish to be susceptible to disease, one of which is caused by bacteria<sup>[2]</sup>.

One disease that can kill up to 100% of fish is a disease caused by infection with the *Aeromonas hydrophila* bacteria, with clinical symptoms in the form of wounds on the body of the fish. This bacterium attacks all ages and almost all fishery commodities in Indonesia, becoming a deadly plague on freshwater fish and causing enormous losses. Control of bacterial-type diseases, is mostly done by administering various kinds of antibiotics. Continuous use of antibiotics and if used inappropriately can cause pathogenic bacteria to become resistant, causing accumulation of drug residues in the body of fish and the aquatic environment<sup>[3]</sup>.

Control of bacterial-type diseases according to Good Fish Cultivation Methods, which is recommended to use drugs that are environmentally friendly, safe, and easy to obtain, namely the use of herbs in the treatment of fish. Based on this, a study was conducted on the use of *Gynura procumbens* powder in catfish feed infected with *Aeromonas hydrophyla* bacteria. This study aims to analyze the effect of giving *Gynura procumbens* with different doses on feed for Catfish (*Pangasius sp*) infected by *Aeromonas hydrophyla* bacteria.

## II. LITERATURE SURVEY

*Aeromonas hydrophila* is one of the pathogenic bacteria that cause disease outbreaks in fish. *Aeromonas hydrophila* infects organs through the digestive tract of fish and can occur through wounds. *A. hydrophila* infection is characterized by ulceration, hemorrhage, and necrosis of visceral organs which are common symptoms. In acute conditions, septicemia occurs rapidly in fish. When infection occurs exophthalmia, skin ulceration, and accumulation of fluid in the skin give rise to ascites. Besides attacking freshwater fish, *Aeromonas hydrophila* bacteria can also attack humans, which are enterotoxigenic and have the potential for pathogenicity in the human digestive tract. *Aeromonas hydrophila* bacterial infection occurs directly but is caused by a weak condition of fish due to stress. Stress will weaken the fish's defense mechanism, eventually causing the fish to be susceptible to disease<sup>[4]</sup>.

Symptoms that appear are usually indicated by the presence of ulcers, hemorrhage on the skin, gills, and oral cavity which can extend to the muscle tissue, and the presence of swelling in the kidneys or spleen. In addition, the color of the body surface becomes blood red, mucus decreases, scales are damaged and fall off, and fins are damaged and cracked. This condition will eventually make the fish lose balance and lead to death<sup>[4]</sup>.

The *Gynura procumbens* plant contains chemical alkaloids, saponins, flavonoids, and tannins. The effects of the flavonoid content in *Gynura procumbens* leaves include anti-inflammatory, antimicrobial and antiviral properties which have great potential as phytopharmaca for fish. Certain flavonoids contain active components to be antimicrobial and antiviral. The presence of tannins in *Gynura procumbens* extract also has the potential as an antibacterial<sup>[5]</sup>.

## III. METHODOLOGY

This research was carried out from December 2021 to January 2022 at the Integrated Laboratory of the Faculty of Fisheries and Marine Sciences, Bung Hatta University, Padang, West Sumatra. The research method used in this study was an experimental method with a completely randomized design (CRD) with 4 treatments and 3 replications. The treatment in this study was feed without the administration of *Gynura procumbens* leaf powder (control/A1); feed + 50 grams of *Gynura procumbens* leaf powder/100 grams of feed, (A2); Pellet feed + 60 gr of *Gynura procumbens* leaf powder / 100 gr of feed (A3), pellet feed + 70 gr of *Gynura procumbens* Leaf powder / 100 gr (A4).

The process of making and mixing *Gynura procumbens* leaf powder is washing it thoroughly with running water, then drying it in the sun to dry. After drying the *Gynura procumbens* leaves are mashed using a blender, then sifted to obtain a powder form, the Kontak Nyawa leaves are ready to be used. Weigh the leaf powder of *Gynura procumbens* according to the treatment, then mix it with the feed by adding egg white as an adhesive, after it mixed until homogeneous and dried by airing and the feed was ready for use.

Parameters observed included clinical symptoms, survival, feeding response, and water quality. The clinical symptoms observed during the observation were behavior including feeding response, movement reflexes, and physical injuries. clinical symptom testing and water quality were analyzed descriptively, while survival and wound coverage data used analysis of variance to see the effect of treatment on test parameters.

## IV. RESULT AND DISCUSSION

Clinical symptoms due to infection with *Aeromonas hydrophila* bacteria such as ulcers or swollen eyes (picture 1), excessive mucus production (picture 2), bleeding, slow movement, lots of silence on the bottom, and very low appetite, because the fish experience a very high level of stress. The recovery process for catfish infected with *Aeromonas hydrophila* in treatment A was very slow (figure 1). due to the absence of the addition of the powder from the leaves of *Gynura procumbens* with the feed for the recovery process in fish.



Figure 1. Figure 2. Clinical Symptoms in Treatment A1



Figure 2. Clinical Symptoms in Treatment A2



Figure 3. Clinical Symptoms in Treatment A4



Figure 4. Clinical Symptoms in Treatment A4

The clinical symptoms such as swollen eyes, excessive mucus production, fish stress, fin bleeding, fin loss, and the growth of ulcers have started to disappear. Other clinical symptoms such as appetite began to increase and fish began to move actively. After the fish were given feed mixed with the leaf powder of *Gynura procumbens* at a dose of 50 gr, 60 gr, and 70 gr they gradually began to show progress, namely they began to show recovery from diseases caused by *Aeromonas hydrophyla* bacteria (treatments B, C and D). It is suspected that the leaves of *Gynura procumbens* have antibacterial properties that can inhibit the growth of bacteria in the body of the fish. The results of this study indicate that the leaf powder of *Gynura procumbens* is able to cure catfish infected with *Aeromonas hydrophyla* bacteria. The improvement in wound conditions and clinical symptoms in catfish was due to the content of alkaloids, saponins, flavanoids, and tannins contained in the leaves of *Gynura procumbens*<sup>[4]</sup>.

Based on the results of one way ANOVA, it was shown that the use of laurel leaf powder doses in feed had a significant effect on shrinkage of catfish wounds ( $P < 0.05$ ). The average wound shrinkage for each treatment is presented in Table 1. Duncan's further test results in Appendix 2 shows that treatment C was not significantly different from treatment D ( $P < 0.05$ ) but significantly different from treatments A and B ( $P > 0.05$ ). The use of laurel leaf powder with different doses in feed did not significantly affect the survival of catfish ( $P > 0.05$ ). Clinical symptoms due to infection with *Aeromonas hydrophyla* bacteria such as ulcers or swollen eyes (figure 1), excessive mucus production (figure 2), bleeding, slow movement, a lot of silence on the bottom and very low appetite, because the fish experience a very high level of stress.

Table 1. Survival Rate and Wound Shrinkage of *Pangasius* sp

Parameter				
Parameter	A	B	C	D
Wound shrinkage (%)	66,67±0,05 <sup>a</sup>	66,67±0,05 <sup>a</sup>	100±0,00 <sup>b</sup>	66,67±0,05 <sup>a</sup>
Survival rate (%)	12,47±1,82 <sup>a</sup>	30,04±5,05 <sup>b</sup>	47,22±3,30 <sup>c</sup>	61,51±12,14 <sup>c</sup>

Mixing feed with the leaf powder of *Gynura procumbens* can inhibit the growth of *Aeromonas hydrophyla* bacteria and the best concentration is found in treatment D with an average value of 61.51%, followed by treatment C with a value of 47.22%, treatment B with a value of 30.04%, and the lowest healing rate was found in treatment A with a value of 12.47% without the mixing of the *Gynura procumbens* leaf powder. *Gynura procumbens* leaves have the potential to be antimicrobial because they contain flavonoids and essential oils. The best concentration is found in treatment D (figure 2) with an average value of 61.51% followed by treatment C (figure 3) with a value of 47.22% and the lowest healing rate was found in treatment A with a value of 12.47% without mixing the leaf powder of *Gynura procumbens*. The fast process of wound shrinkage in treatments C and D is thought to be due to the content contained in the leaf powder of Kontak Nyawa in the feed which is able to inhibit the growth of *Aeromonas hydrophyla* bacteria. The more fish eat the feed mixed with the leaf powder of *Gynura procumbens*, the faster the recovery time.

According to 5. Kaewseejan et al.,<sup>[5]</sup> the flavonoids in the leaves of *Gynura procumbens* contain active components to be antimicrobial and antiviral. The average survival in this study was 66.67% - 100% in all treatments. However, in repetitions in treatments A, B, and D there were dead fish. Fish that died in repetitions A3, B1, and D1 were suspected because the fish experienced stress after being injected with the *Aeromonas hydrophyla* bacteria which also affected water quality caused by leftover feed. When the fish dies there is excessive mucus all over the surface of the fish's body. This condition can also be caused by other factors that affect fish, namely environmental conditions, especially water that is polluted by leftover feed. Feeding response and the amount of feed consumed by fish during the study period will affect the effectiveness of treatment in fish. The more treatment feed is eaten, the more effective the treatment process is. Food is one of the factors that influence growth which functions as a body-building substance, a source of energy, and a substitute for damaged body cells.

The response to eating fish after being injected with bacteria has decreased because the fish are experiencing stress so the fish have no appetite, and the movement of the fish is very slow and a little aggressive with outside activities. On the 5-7th day after the injection process, the fish's appetite decreases again, this is because the bacteria in the fish's body begin to attack the whole body. swollen and pale white, the color pigment on the fish's body fades and bleeding on the fish's fins. Observation of fish response to feed was carried out from the beginning to the end of the treatment. The response of fish to this feed was observed when feeding was carried out in each treatment and was measured from the feed side by reducing the feed that should have been given (3%) with the remaining feed for one day. Treatment A had a low response to eating from day to day. This was suspected because the fish had not recovered from *Aeromonas hydrophyla* disease so their appetite was not stable. In treatment B, the response to feeding showed that at the beginning of the feeding, mixed with the leaf powder of *Gynura procumbens*, it began to respond slightly until it got used to it and there was an increase in appetite. Treatment C had a fairly good eating response, while treatment D showed a normal eating response.

Table 2. Parameters of water quality of maintenance media

Parameters	A	B	C	D
Temperature (°C)	26.5-27	26-27	26.5-27	27-28
pH	6-7	6-7	6-7	6-7
DO (ppm)	3.48-3.63	3.41-4.10	3.68-3.86	3.64-3.69

The quality of the water for raising catfish in the aquarium has a temperature range of 26.5°C to 27°C, thus the temperature obtained is still good and suitable for fish life. Good temperature for fish life is around 24 °C to 28 °C. The water range of pH 6-9 is considered safe for fish. During the study, the pH of the water was 7 from the beginning of the study to the end of the study and it was in a good range for fish life. The content of dissolved oxygen or DO during the study was 3.41 - 4.1 ppm. Water physicochemical parameters such as dissolved oxygen (DO) concentration and temperature are some of the parameters that receive the most attention because they reflect water quality and the health of an aquatic ecosystem. The minimum concentration limits and the role of DO for aquatic ecosystems reflect the ability of water bodies to adapt to the presence of pollutant loads. DO greatly affects the life of fish, especially in growth, tissue repair, and reproduction<sup>[1]</sup>.

## V. CONCLUSION

The results showed that the best dose for wound healing due to *Aeromonas hydrophyla* bacterial infection in catfish using *Gynura procumbens* leaf powder was treatment D (70 gr / 100 gr feed) with wound shrinkage of 61.51% and the survival rate during the study was around 66.67% - 100%.

## REFERENCES

- [1] Simamora, V. N., Djauhari, R., Christiana, I. 2021. Growth Performance Of Catfish Seeds (*Pangasius* sp.) Which Is Given An Anthill Tuber Extract. Journal of Fsh Health Vol. 1 (2): 98-105
- [2] Yustina, Wulandari, S., Priawan, O. 2021. Observation of Growth Rate of Catfish (*Pangasius* sp.) Against Mixed Feed Fermentation of Mustard and Cabbage Waste Flour. intechcom: Science, Technology, and Communication Journal Vol. 2 , No. 1: 26-31
- [3] Bojarski, B., Kot, B., and Witeska, M. 2020. Antibacterials in Aquatic Environment and Their Toxicity to Fish. Pharmaceuticals 13(189): 1-23
- [4] Nayak, S. K. 2020. Current prospects and challenges in fish vaccine development in India with special reference to *Aeromonas hydrophila* vaccine. Fish and Shellfish Immunology 100: 283–299
- [5] Kaewseejan, N., Sutthikhum, V., Siriamornpun, S. 2015. Potential of *Gynura procumbens* leaves as source of flavonoid-enriched fractions with enhanced antioxidant capacity. Journal of functional foods 12 : 120 – 128