



Improving the Quality of Tilapia (*Oreochromis niloticus*) With consumption measures Leaf Extract Neem (*Azadirachta indica A. Juss*) as Antiparasitic



Sang Ayu Made Putri Suryani ^a, I Wayan Arya ^b,

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Correspondence Author ^a



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Neem Extract;
Oreochromis Niloticus;

Abstract

Fish disease control with the use of chemicals and antibiotics have been widely researched usefulness, perceived use of the above ingredients cause a lot of side issues especially when the use of such materials exceeding the threshold value. Based on the various studies that are now addressed to more effectively and efficiently with a minimum negative impact, both in prevention and in the effort to control or treatment. Based on the problems it is one of the ingredients selected as the material parasite control as well as sanitary materials and prevention of transmission of fish diseases are the leaves of the neem plant (*Azadirachta indica A. Juss*). Control pests by using neem as insecticide plant have biological profit pest control. The long-term goal of this research is to gain Tilapia are free of parasites and is safe for consumption and fish farming environment safe from chemicals so that production can be increased and produce high-quality Tilapia fish consumption. The results were obtained kinds of types The types of parasites that attack Tilapia is *Dactylogyrus sp*, *Gyrodactylus sp*, *Tricodina sp*, *Vorticella sp*, *Oodinium sp*, *Saprolegnia sp* and after soaking the neem extract was found parasites *Gyrodactylus* at 25 ppm, the concentration of the most effective used is 20 ppm and the prevalence of *Dactylogyrus sp*, *Gyrodactylus sp*, *Vorticella sp*, *Oodinium sp*, and *Saprolegnia sp* is 0-40%, while *Tricodina* is 10-30% and the survival rate is between 84-100%.

^a Water Resources, Warmadewa University - Manajemen 80239 Denpasar Indonesia
(suryanip@rocketmail.com)

^b Water Resources, Warmadewa University - Manajemen 80239 Denpasar Indonesia

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1. Introduction

Disease in fish is one of the problems in the cultivation and import-export business that is often encountered.¹⁸ Disease not only attack humans but also attack livestock and crops, as well as with the fish that live in the water is also not immune from attack illnesses caused by parasites, fungi, viruses and those caused by some sort of chemical substances that form of pollution so that organs fish were damaged and there was a disease.¹

The presence of this disease is closely related to the environment where the fish are located. For the prevention and treatment of diseases in addition to controlling the environment is also important to know things that are concerned with the onset of the fish itself.² In the efforts to address disease some chemicals and antibiotics have been widely studied its usefulness for the eradication of diseases of fish,¹⁹ however, the use of the above ingredients perceived to cause a lot of side issues especially when the use of such materials is not within the rules. Based on the various studies that are now addressed to more effectively and efficiently and with a minimum negative impact, both in prevention and in the effort to control or treatment. So in control efforts, especially finding the ingredients of effective and environmentally friendly is also very urgent to be studied, especially the ingredients are organic.³

The previous study states that Neem Leaf Extract Effect on Fish Seed Carp saw that, overall, found seven species of parasites in fish seed test consisting of five classes, namely *Oligomenorrhoea*, Crustacean, *trematodes monogenic*, Sporozoa myxosporean. After soaking at a dose of 20 ppm is not found parasitic on carp fish seed.⁴ The problem faced by the farmers, in particular, Tabanan regency, Bali is the limited supply of quality seeds Tilapia fish from the mother to the limited quality and continuity of the production capability of the consumer market.²⁰ Besides, especially Tilapia fish seed farmers in Tabanan has not been able to anticipate the Tilapia fish parasites invade without the use of chemicals that keep environmental conditions remain stable.

Neem leaf contains compounds nimonol, nimbolida, 28-deoksinimbolida, a-linolenic, 14-15-epoksinimonol, melrasinol, and nimbotalin.⁵ According to¹² neem plants benefit greatly contributed to human life. Neem seeds can be used as a natural insecticide. In addition, also serves as a killer fungus (fungicides) and the killer bacteria (antibacterial). Various benefits of neem leaves are closely related to the chemical components it contains.¹³ The metabolites were found from *Azadirachta indica*, among others disetil vilasinin, nimbandioli, 3-desasetil salanin, salanol, azadirachtin. Seeds containing azadirachtin, azadiron, azadiradion, epoksiazadiradion, gedunin, 17-epiazadiradion, 17-hydroxy azadiradion, and alkaloids.¹¹ Metabolites are found in fresh twig extract soluble diklorometana among others desasetil nimbinolid, desasetil nimbin, desasetil isonimbinolid. The bark and root bark contains nimbidin, nimbosterol, nimbosterin, sugiol,

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nimbiol, margosin (an alkaloid). Results hydrolysis flower extract was found quercetin, kaempferol, and little myricetin. From the wooden parts are found nimaton, 15% condensed.^{15,16,17} Fruit tanning substances containing alkaloids (azaridin).^{9,10} Leaves contain Paraisin, an alkaloid and volatile oil component containing sulfide compounds. Green stalks and twigs containing 2 tetranor triterpenoids hidroksibutenolida namely desasetilnimbinolida and desasetilisonimbinolida which was isolated along with desasetilnimbin. In addition, there are also 17-epiazadiradion compound, 17-p-hidroksiazadiradion, azadirachtin, azadiron, azadiradion, epoksiazadiradion, and gedunin.¹³

The benefits of neem leaves as very profitable botanical pesticides for farmers in biological pest control and in addition can also be used as traditional medicine for health. Plant neem as a pesticide plant has an effective working power, economical, safe, readily available and environmentally friendly.^{7,8} Toxic substances contained in the neem plant useful as insecticides, repellent, acaricides, growth inhibitors, neumatisida, fungicides, anti-virus. Toxins such as stomach poisons and systemic. Neem has anti-insect with azadirachtin as a component of the most patent.⁶

2. Research Method

The method used in this study, are: the experimental method to the treatment dose of 10 ppm, 15 ppm.²³ 20 ppm and 25 ppm will be tested on 50 fish Tilapia consumption measures are already infected with the parasite for each treatment. Experiment container filled with water with a volume of 40 liters for each container, and then enter the neem leaf extract at a dose that has been determined, namely, A: 10 ppm, B: 15 ppm, C: 20 ppm, D: 25 ppm. Then grab 200 tail tilapia from the temporary shelter and input 50 fish in each container were mixed with neem leaf extract and allowed to stand for 30 minutes. After soaking is performed for 30 minutes, the fish seed directly transferred to another container that is filled with water and carried flushing for 1 hour.²² Then take five fish seed samples from each respective container to at first enter into a plastic bag that is labeled and stored temporarily in a cooling box, then observed under a microscope. Parasites were found later identified with the help of identifying books. Objects parasite that is found recorded and documented with a digital camera. Image capture is done of the objective lens on the microscope. Data parasites are found then identified and then tabulated.²¹ The collected data is recorded in the table and the pictures in particular to the data type of parasite, then newly identified. Identify results re-recorded in tabular form in accordance with the classes and species of parasites found. In each dosage also is recording in a table that includes other types of parasites on each observation in the microscope and calculates the survival rate by the formula: The collected data is recorded in the table and the pictures in particular to the data type of parasite, then newly identified. Identify results re-recorded in tabular form in accordance with the classes and species of parasites found. In each dosage also is recording in a table that includes other types of parasites on each observation in the microscope and calculates the survival rate by the formula: The collected data is recorded in the table and the pictures in particular to the data type of parasite, then newly identified.²⁴ Identify result re-recorded in tabular form in accordance with the classes and species of parasites found. In each dosage also is recording in a table that includes other types of parasites on each observation in the microscope and calculates the survival rate by the formula:

$$SR = \frac{\text{Amount fishes alive}}{\text{total of sample}} \times 100\%$$

3. Results and Analysis

The observations in the laboratory before Tilapia before treatment were treated with neem leaf extract was overall found six species of parasites which attack fish sample was *Dactyloyrus sp*, *Gyrodactylus sp*, *Tricodina sp*, *Vortycella sp*, *Oodinium sp*, and fungus *Saprolegnia*

Table 1
Types of Parasites Found Attacking Tilapia


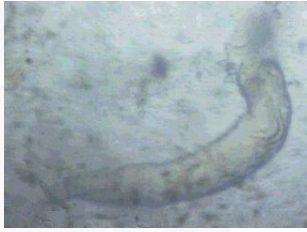



| No. | Name | Picture |
|-----|------------------------|--|
| 1 | <i>Dactyloyrus sp</i> |  |
| 2 | <i>Gyrodactylus sp</i> |  |
| 3 | <i>Tricodina sp</i> |  |
| 4 | <i>Vorticella sp</i> |  |
| 5 | <i>Oodinium sp</i> |  |

Table 2

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Survival rate after treatment

| Treatment (ppm) | Survival rate (%) |
|-----------------|-------------------|
| A(10) | 100 |
| B(15) | 100 |
| C(20) | 100 |
| D(25) | 84 |

Table 3
Prevalence of Tilapia's Parasite

| No | Type of parasite | Prevalence (%) | | | |
|----|------------------------|----------------|--------|--------|--------|
| | | 10 ppm | 15 ppm | 20 ppm | 25 ppm |
| 1 | <i>Dactyrogilus sp</i> | 40 | 30 | 0 | 0 |
| 2 | <i>Gyrodactilus sp</i> | 40 | 40 | 0 | 0 |
| 3 | <i>Tricodina sp</i> | 30 | 30 | 10 | 10 |
| 4 | <i>Vorticella sp</i> | 40 | 40 | 0 | 0 |
| 5 | <i>Oodinium sp</i> | 40 | 20 | 10 | 0 |
| 6 | <i>Saprolegnia sp</i> | 40 | 30 | 0 | 0 |

Changes in behavior (behavior) are the change in fish are diseased. In this study, there are several different behavioral changes observed in tilapia, among tilapia with each other in one place of cultivation. The observed changes include:

- a. There was a decrease in appetite and response to food when the fish is fed, especially during the morning and afternoon. By the time the fish fed the fish looks uninterested or react to grab the food even though the food is close to his mouth, and even the fish looked away from food and leave other fish that eat scramble.
- b. The response to the shock is very less and the movement of the fish becomes very slow and tends to be passive. When given a shock, for example by being given the beat of the water or in the dike, a healthy fish will react quickly and run away from the source of the beat/interference, but the fish are sick tend not react even look calm and silent, even if moving movement is very slow and passive, p this depends on the severity of the disease. The more severe the disease then the slower the movement of fish and shock response also decreases. Sick fish are often located near the dike, separate from the other fish are still healthy, with a relatively rapid breathing, posture tends to hang in the water or stick in the dike.
- c. Swim irregular. Sick fish also showed that changes in terms of swimming, swim sometimes oblique and spinning is not necessarily the direction, there is also a swimming seemed upbeat after the silent, this indicates that the fish trying to swim but it was very difficult.
- d. Respiratory sick fish very quickly visible from the opening and closing movement patterns overcolum or gill cover the frequency is very fast, the water in the corner of his mouth to cause white froth and mixed with mucus out of the fish's mouth. It showed the fish had difficulty breathing (such as shortness of breath), so lack of oxygen. Handajani and Samsundari, (2005) suggest a few things and the symptoms shown by fish disease is preceded by a decrease in appetite, the movement slowed, rapid breathing such as lack of

oxygen, swim skewed due to loss of balance, often gathered unnatural at the water inlet and no response to a surprise.

- e. Tilapia indicated disease, as observed carefully the body and organs other than the color showed some abnormalities or changes in normal circumstances, as shown some abnormalities in organs outside of tilapia that is bleeding are quite severe on the gills and some other body parts such as the base of the scales, the base of the fin, especially on the tail fin and pelvic fins. Fins saw many drop out or gripes and scale too much loose, especially in the bleeding.

From the results of the study before it is given treatment with immersed in a solution neem leaf extract, found 6 species of the parasite found in fish body samples are: *Dactylogyrus sp*, *Gyrodactylus sp*, *Tricodina sp*, *Vorticella sp*, *Oodinium sp*, *Saprolegnia sp*, from the class Trematoda, Monogenia, and Saprolegnia. At 10 ppm to 6 parasites still attacked Tilapia, at 15 ppm to 6 parasites still attacked but declined, at 20 ppm *Dactylogyrus* and *Gyrodactylus* not found, *Tricodina* found one, *Vorticella* not found, *Oodinium* found one in a state of rupture and *Saprolegnia* not found, *Oodinium* found in one sample in a state of rupture. While on *Dactyrogilus* gills can be removed completely so that these parasites are not found in all samples. At 25 ppm there is only *Gyrodactylus*. The prevalence or frequency of occurrence is the percentage of fish that infected by certain parasites of fish samples tested, the goal is to determine the extent of the attack a parasite on fish populations that exist on farms. *Tricodina sp* has the lowest prevalence is reaching 30%, which means that 30% of the fish already infected *Tricodina*.

The prevalence of values shows that the death of the fish, tilapia or pain caused by many types of parasites or complications of various types of parasites. At 10 ppm prevalence *Dactylogyrus*, *Gyrodactylus*, *Vorticella*, *Oodinium*, high *Saprolegniayang* reaching 40% means the death or illness of tilapia absolute result by 6 species of the parasite, given the prevalence *tricodina* another relative who is also quite high. At 15 ppm *Gyrodactylus* and *Vorticella* have the highest prevalence reached 40% which means that 40% of the fish already infected *Gyrodactylus* and *Vorticella*, followed by *Dactyrogilus sp*, *Saprolegnia*, and *Tricodina* 30%, and 20% *Oodinium sp*. The pain of tilapia from complications of various types parasit. In 20 ppm *Tricodina* and *Oodinium* had a prevalence of 10% means that 40% of the fish already infected. *Dactylogyrus*, *Gyrodactylus*, *Vorticella* and *Saprolegnia* prevalence of 0 means no Tilapia fish parasite infected because soaking with neem extracts 20 ppm can be a deadly parasite. At 25 ppm prevalence immersion, *Tricodina* had a prevalence of 10% means that 10% of the fish already infected. *Dactylogyrus*, *Gyrodactylus*, *Vorticella*, *Oodinium* and *Saprolegnia* prevalence of 0 means no Tilapia fish infected with this parasite because soaking neem extracts 25 ppm can be a deadly parasite.

The prevalence of attacks each parasite species at 10 ppm and 15 ppm is the most severe, Cooperation of poor environmental factors and a high prevalence of pathogens that lead to even more nasty tilapia conditions and the increasing number of dead fish. There are many factors that determine a fish becomes ill. Cooperation of poor environmental factors and a high prevalence of pathogens that lead to even more nasty tilapia conditions and the increasing number of dead fish. Survival rate Tilapia after soaking and carried incubation for 7 days we got the result that the concentration of the extract of neem from 10, 15 and 20 can still be tolerated by Tilapia so the survival rate is 100% while soaking 25 ppm, the survival rate is 84% for a concentration of 25 ppm Tilapia interfere with activity as high a concentration.

4. Conclusion

The types of parasites that attack Tilapia is *Dactylogyrus sp*, *sp Gyrodactylus*, *Tricodina sp*, *Vorticella sp*, *sp Oodinium*, *Saprolegnia sp* and after soaking the neem extract was found parasites *Gyrodactylus* at 25 ppm, the most effective concentration used was 20 ppm. Prevalence *Dactylogyrus sp*, *Gyrodactylus sp*, *Vorticella sp*, *Oodinium sp*, and *Saprolegnia sp* is 0-40% and 10-30% *Tricodina* and the survival rate is between 84-100%

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Biography of Authors

| | |
|--|---|
|  | <p>Name : Dra. Sang Ayu Made Putri Suryani, M.Si Address : Jl. Narakusuma Gang VI No. 4 Denpasar Occupation : Lecturer Aquatic Resource Management, Agriculture Faculty, Warmadewa University Education : 1. Biology Science, Airlangga University, Surabaya 2. Molecular Biology, Brawijaya University, Malang 3. On-Going Ph.D. at Udayana University, Denpasar</p> |
|  | <p>Name : Ir. I Wayan Arya, M.P Address : Jl. Diponegoro IIA No. 5 Tabanan Occupation : Lecturer Aquatic Resource Management, Agriculture Faculty, Warmadewa University Education : 1. Aquatic Resource Management Department, Agriculture Faculty, Warmadewa University 2. Biotechnology, Udayana University</p> |

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