Potential of Karamuting (Rhodomyrtus Tomentosa) Fruit Filtrate on Reducing Ammonia Levels in Catfish (Pangasius Pangasius)

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ABSTRACT
Ammonia is a chemical compound that has the molecular formula NH3 which can pollute the environment with a very pungent odor. Rivers polluted with ammonia can cause poisoning to living things around the waters. While the community often consumes Lawang fish caught from the Barito River. The decrease in ammonia levels can be reduced by using plants that contain saponin compounds, such as Karamunting which has a high level of saponin compounds in its fruit. Knowing the potential of Karamunting fruit filtrate in reducing ammonia levels in Lawang fish and the effect of different concentrations of Karamunting fruit filtrate in reducing ammonia levels in Lawang fish. This study uses True Experimental,data collection in this study with the method of observation and documentation,sampling using Purposive Sampling method, determination of Ammonia levels using phenate and Nessler methods. Determination of Ammonia reduction using the Uv-VIS spectrophotometry method. Reducing ammonia levels using Karamunting fruit filtrate on fish 1, fish 2, and fish 3. Obtained significant reduction results in samples of 25%, 50%, 75%. Fish 1 sample 25% (22.877), 50% (27.117), 75% (-6.652). Fish 2 samples 25% (7.850), 50% (16.380), 75% (19.235). Fish 3 samples 50% (2,465), 50% (7,547), 75% (16,100). The decrease in Ammonia levels occurs because Saponins have good detergent properties, so Ammonia levels can be lowered. In this study, it can be concluded that the value of the research hypothesis is 0.938, which means that the research hypothesis is rejected or there is no significant effect on differences in the concentration of Karamunting fruit filtrate on decreasing Ammonia levels in Lawang fish. In this study, 4 different concentrations were used, namely 25%, 50%, 75%, 100%, but the optimal concentration was 75%.

INTRODUCTION

The Barito River is polluted with ammonia compounds, at a distance of 2 meters it is 4.425 mg/L, a distance of 5 meters is 3.198 mg/L and a distance of 10 meters is 1.135 mg/L[1]. This value exceeds the allowable ammonia level in river water, which is 0.5 mg/L[2]. If ammonia dissolves in water, it can cause an increase in ammonia levels which causes poisoning for living things around the waters[3].

This is quite dangerous if people often consume the fish they catch in rivers polluted with ammonia, because it can cause ammonia to accumulate in the body and in the long term will have an unwanted health impact. For example in a research, High ammonia levels can cause shortness of breath, chest pain, coughing up blood, bronchitis and pneumonia [4].

Ammonia in fish meat is formed from the decomposition of urea, in which the urease enzyme catalyzes the hydrolysis of urea into ammonia and carbon dioxide. Reducing ammonia levels can be done by reducing urea levels, one way that can be used to reduce urea levels is with compounds that contain saponin compounds.

Reducing ammonia levels can be done by reducing urea levels, one way that can be used to reduce urea levels is with compounds that contain saponin compounds. From the results of research conducted on reducing urea levels using natural ingredients with a combination of cucumber and vinegar. The results showed that saponins could reduce urea levels in fish meat[5]. Saponin compounds can be found from various plants such as guava, belimbing wuluh, bidara leaves and karamunting. Saponins can reduce levels of BUN (blood urea nitrogen), serum creatinine, and urine protein by inhibiting the mitochondrial apoptotic

pathway[6]. Based on research results that the addition of saponins can reduce NH3 levels in cattle by decreasing ammonia by 15% when 60mg/kg saponins are added in moderate incubation.

All parts of the karamunting plant have chemical compounds in the form of: flavonoids, alkaloids, steroids, and saponins. Saponin compounds contained in flowers (0.0569%), fruit (0.792%), leaves (0.417%), stems (0.404%), and roots (0.416%)[7].

METHOD

a. Preparation of Karamunting fruit filtrate

Discard the fruit skin and take only the fruit part and squeeze the fruit using a flannel cloth until liquid is obtained from the fruit, then filtered and the filtrate is taken.

b. Sample Testing

1) Pipette 3 ml each - each sample that has been prepared
2) Enter into each - each Erlenmeyer
3) Add 1 ml Phenol and mix well
4) Add 1 ml of Sodium Nitropusida and homogenize
5) Add 2.5 ml of oxidizing solution and homogenize
6) Close each Erlenmeyer and let stand for 24 hours to form color
7) Put it in the cuvette
8) Read the absorbance with UV-Vis Spectrophotometry with the wavelength that has been screened
9) Calculate the concentration of each sample with the formula:

$$y = a + bx$$

Information :
y = absorbance of sample (mg/L)
a = Intercepts
b = Slopes
x = Concentration

10) Calculate the reduction in ammonia levels in Lawang fish with each level that has been obtained through UV-Vis Spectrophotometry with the formula for reducing levels as follows:

$$Ef = \frac{Co - Ci}{Co} \text{x} 100\%$$

note:
Co: Initial Concentration
Ci: Final Concentration
Ef: Percentage of Ammonia Reduction

RESULT

a. Ammonia (NH_3) Calibration Curve

Table 1. Concentration vs Absorbance of Ammonia Calibration (NH3)

Concentration	**absorbance**			**Average**
	I	II	III	
1 ppm	0.198	0.198	0.199	0.198
3 ppm	0.368	0.358	0.359	0.358
5 ppm	0.512	0.512	0.512	0.512
7 ppm	0.748	0.748	0.748	0.748
9 ppm	1,242	1,242	1,242	1,242
11 ppm	1,921	1,924	1,921	1,922

b. Ammonia (NH_3) Levels in the Sample

Fish sample 1 obtained the absorbance and concentration of ammonia as follows :

Table 2. Absorbance Value and Concentration of Fish Samples 1

Sample	Replication			Average	Concentration (mg/L)
	I	II	III		
0% concentration	1,596	1.595	1.595	1.5953	10,591
0% concentration	1,596	1.595	1.595	1.5953	10,591
0% concentration	1,596	1.595	1.595	1.5953	10,591
0% concentration	1,596	1.595	1.595	1.5953	10,591
0% concentration	1,596	1.595	1.595	1.5953	10,591

Fish sample 2 obtained the absorbance and concentration of ammonia as follows :

Table 3. Absorbance Value and Concentration of Fish Samples 2

Sample	Replication			Average	Concentration (mg/L)
	I	II	III		
0% concentration	1.595	1.595	1.5953	10,591	1.595
Concentration 25%	1.117	1.119	1.1186	8.167	1.117
Concentration 50%	1.112	1.113	1.1123	7,719	1.112
Concentration 75%	1,701	1,697	1.6983	11.286	1,701
Concentration 100%	1,833	1,834	1.8336	12.109	1,833

Fish sample 3 obtained the absorbance and concentration of ammonia as follows:

Table 4. Absorbance Value and Concentration of Fish Samples 3

Sample	Replication			Average	Concentration (mg/L)
	I	II	III		
0% concentration	0.935	0.938	0.939	0.937	6,625
Concentration 25%	0.908	0.912	0.910	0.910	6,488
Concentration 50%	0.852	0.851	0.852	0.851	6,129
Concentration 75%	0.757	0.765	0.758	0.761	5,581
Concentration 100%	0.590	0.592	0.591	0.591	4,456

c. Decreased Ammonia (NH_3) Levels

Table 5. Percent of Decreased Ammonia Levels in Fish 1

Filtrate Concentration	Content (mg/L)	Decrease in Ammonia Levels (%)
25%	8.167	22.877%
50%	7,719	27.117%
75%	11.286	-6.562%
100%	12.109	-14.332%

Table 6. Percent of Decreased Ammonia Levels in Fish 2

Filtrate Concentration	Content (mg/L)	Decrease in Ammonia Levels (%)
25%	9,074	7.850%
50%	8,234	16.380%
75%	7,944	19.235%
100%	8,396	14.735%

Table 7. Percent of Decreased Ammonia Levels in Fish 3

Filtrate Concentration	Content (mg/L)	Decrease in Ammonia Levels (%)
25%	6,488	2.465%
50%	6,129	7.547%
75%	5,581	16.100%
100%	4,456	33.012%

DISCUSSION

Prior to conducting the research, the preparation and manufacture of materials such as phenol solution which functions to liberate ammonium ions into ammonia ions, sodium nitroprusside solution functions as an indophenol catalyst, alkaline citrate solution functions in the manufacture of oxidizing solutions, sodium hypochlorite solution as an oxidizing agent and oxidizing solution. serves to oxidize the test sample[1].

The first quantitative test was testing for Ammonia (NH3) levels by screening for Ammonia (NH3) wavelengths which were carried out at the Pharmaceutical Chemistry Laboratory of Sari Mulia University using a UV-Vis Spectrophotometry instrument. This screening aims to determine the maximum wavelength of Ammonia using a 1000 ppm Ammonia standard solution made directly by the researcher, then diluted to 100 ppm by adding distilled water to the volumetric flask limit. The results obtained were a screening wavelength of 621 nm which was then used to measure the absorbance of the test sample.

The results of the absorbance of the standard series are intercept (a) = -0.156, slope (b) = 0.1643 and correlation (r) = 0.9508. Based on the results obtained, the higher the concentration of the solution, the higher the absorbance results. The straight line equation between concentration and absorbance has a good correlation coefficient (r), which is 0.9508. The correlation coefficient is a measure used to determine the degree of relationship between variables. If the r value of the correlation coefficient is close to 1, it indicates that there is a linear relationship between the measured absorbance and the analyte concentration[8]. The straight line equation between concentration and absorbance has a good correlation coefficient (r), which is 0.9508. The correlation coefficient is a measure used to determine the degree of relationship between variables. If the value of r = 1 then the correlation is perfectly positive and if the value of r is 1 then the correlation is quite good, then this value meets the requirements[9].

In table 4.6 for fish sample 1, table 4.6 for fish sample 2, and table 4.7 for fish sample 3. Based on the interpretation of the results obtained, it can be seen that there was a decrease in Ammonia levels in all fish samples from concentrations of 25%, 50%, 75%, and 100%. But after being averaged, it can be seen that the highest reduction in ammonia levels was in 2 and 3 at a concentration of 75% of 19.235% and 16.100%. However, there was an increase in concentration in fish 1 with 100% of -14.332% and in fish 2 with a 100%

sample of 14.735%. This can happen because the carboxyl group in saponins experiences the most optimal deprotonation so that a neutralization reaction has occurred or is experiencing a saturation point[10]. Based on research showed that the optimal soaking was found in soaking with 80% bean sprout filtrate (80 ml of bean sprout filtrate and 20 ml of water) for 3 hours[5]. Whereas in the research that I did, I got optimal immersion at 75% ml of filtrate. The decrease in Ammonia levels is due to the fact that Saponins have good detergent properties so that the decrease in Ammonia levels can be reduced [11].

The results obtained were then entered into the SPSS system using the One Way Anova method to determine whether there was a significant effect from the test results or not on the control group (without treatment) and the treatment group. Before using the One Way Anova method, the results were tested first for normality and homogeneity. his.

Based on the results of the normality test the Shapiro-Wilk magnitude is 0.913, because the significance is greater than 0.05 which means that the data distribution in this study is normally distributed[12].

The next test that was carried out was the homogeneity test. The data homogeneity test aims to test whether it has homogeneous data or not and the homogeneity test is the second condition that must be met if you want to test data using the One Way Anova test. It can be seen that the probability value (p) = 0.367 where the p value is> 0.05 which means accepting H0, so it can be seen that the data can have the same or homogeneous variance. Thus the requirements for conducting data testing using the One Way Anova test have been fulfilled and can proceed to the next stage, namely the One Way Anova test.

In the One Way Anova Test above, the results obtained where the probability value (p) = 0.938 or the value (p) > 0.05. So it can be stated that there is no significant effect on differences in the concentration of Karamunting fruit filtrate on decreasing Ammonia levels in Lawang fish. Meanwhile, if seen from the sig count value, it is 0.938, namely > 0.05, which means this shows the results obtained H0 > 0.05, the hypothesis is rejected, this is because the decrease that occurred was very small while the concentration used was quite large (25%, 50 %, 75%, 100%) and the decrease is not significant.

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