TEST OF THE EFFECTIVENESS OF MANGA KWENI LEAF EXTRACT (MANGIFERA ODORATA GRIFF) AGAINST CANDIDA ALBICANS FUNGUS

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ABSTRACT

The purpose of this study is to find out whether mango kweni leaf extract (Mangifera ododratagriff) can inhibit the growth of Candida albicans fungus.It was found that there was an optimal concentration of ethanol extract from mango kweni leaves (Mangifera ododratagriff). The approach of this research is to use a type of laboratory experimental quantitative research using data collection techniques including tools and materials, sample preparation, antifungal testing and data analysis techniques using the SPSS One Way Anova Statistical test if the data does not meet the parametric requirements, then it is followed by a non-parametric alternative test, namely Kruskal Wallis, and to see the maximum and minimum concentrations seen from the Duncan test test. From the results of the antifungal test of Candida albicans in each treatment, the inhibition zone was obtained at concentrations of 2%, 4%, 5.83 mm, 6%, 8.74 mm, 8%, 10.85 mm and 10% 12.38 mm. The results and conclusions of the researcher show that; 1) There is an effectiveness of mango leaf extract (Mangifera odorata griff) in inhibiting the growth of Candida albicans fungus; 2) Mango kweni leaf extract (Mangifera odorata griff) with a minimum concentration of 2% and a maximum of 10% which has been carried out in the statistical test of the Duncan test.

Keywords: Effectiveness, Extract, Kweni Mango Leaf, Candida Albicans

INTRODUCTION

Due to its ease of reproduction in a humid environment, fungi are one of the main causes of disease. *Candida albicans* is one of the pathogenic fungi that attack humans. The mucous membranes of the mouth, vagina, and digestive tract are home to fungi *Candida albicans* which is in the form of saprophyte. Due to a weak immune system, *Candida albicans* can be pathogenic under certain circumstances. Transmission *Candida albicans* In humans, it is usually called candidiasis. Men and women of different ages can get candidiasis. [1]

The World Health Organization (WHO) estimates that 10-15% of 100 million women worldwide suffer from candidiasis every year. Of the 750 people in Shiran City, Iran, Between 2015 and 2019, Hosein, K. et al. conducted a study and found that 304 people had skin conditions caused by fungi *Candida albicans*.

About 20-25% of the population in Indonesia suffers from candidiasis, which mostly affects the mouth,

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throat, mucous membranes, skin, and hair. This is due to the climate in Indonesia, poor sanitation practices, and unhealthy lifestyles that encourage mold growth. If fungal infections are not treated efficiently, the disease can progress to chronic diseases including diabetes mellitus (DM) and tuberculosis (TB) [2]

Gorontalo City in 2020 in a report on pain levels at local health centers, the prevalence of skin diseases due to fungal infections reached 4.76% (476) cases. Where in previous research with the identification of [2] *Candida albicans.* Diabetes mellitus in the urine of Gorontalo City Hospital Prof.Dr.H.Aloei Saboe. For women with diabetes, increased urinary sugar is the cause of endogenous candidiasis. Candida fungi have the potential to thrive in this concentration. The frequency of candidiasis in 44 female respondents with DM was 20.5% with a chance of 0.002. After fasting and praying, 92 (85%) of the 108 type 2 diabetic patients developed xerostomia and candidiasis. For women with diabetes, increased urinary sugar is the cause of endogenous candidiasis. Candida fungi have the potential to thrive at this concentration.

Drug therapy commonly used to treat candidiasis is antifungal chemical drugs in both oral and topical dosage forms such as fluconazole, ketoconazole, nistatin, griseofulvin, or amphotericin B. Some people may experience side effects with topical antifungal therapy, including burning, itching, stinging, and skin irritation. In addition, the fungus can develop resistance to antifungals if given continuously [3]

Investigating natural antifungal medications is essential to counteract the side effects resulting from the manufacture of antifungal medications. Plants are one of the plants that can be used as natural medicine. Due to the absence of side effects, this plant is often used as a medicine to treat diseases. It is known that most plant-based antifungal agents contain secondary metabolite chemicals, specifically in phenolic groups and terpenes. One type of plant that has medicinal properties is the mango plant. Mango plant *(Mangifera indica L.)* It has the potential to become an herbal medicinal plant due to the presence of secondary metabolite compounds. The mango plant has been studied in the past for its potential as an anticancer, antibacterial, and antioxidant. Due to the presence of secondary metabolites in mango plants, including tripenoids, flavonoids, saponins, and tannins. [4]

It states that mango leaf ethanol extract has a major impact on wound healing, reproductive health, and diabetes prevention. This extract is also known to have analgesic, anti-inflammatory, larvicide, fungal, antioxidant, and pesticide properties. Mango leaf ethanol extract is also said to have antifungal properties.

Mango kweni is one of the mango plants whose leaves are

underutilized in the community. Mango Kweni*(Mangifera odorata griff)* is a plant that is widely found throughout Indonesia, including the Gorontalo area. However, the people of Gorontalo only eat the fruits of the plant, throw away and burn the leaves. Based on the background of the information provided, scientists are investigating the efficacy of mango kweni leaf extract (*Mangifera odorata griff)* in combating the fungus *Candida albikans.* Because there are still many people who do not know the various benefits of mango leaves for health.

METHOD

This study uses a quantitative approach with the type of research used in this study is a laboratory experiment with a complete random design (RAL). The research was collected directly by the researchers from the results of the efficacy assessment *(Mangifera odorata griff)* (kweni mango leaf extract) on the growth of the fungus *Candida albicans*. *Autoclaves, ovens, incubators, Laminar Airflow (LAF), shakers, stirrers, analytical scales, hot plates,* calipers, analytical scales, micropipettes, petri dishes, beakers, *erlemeyers,* measuring cups, separation funnels, tube racks and test tubes, bottle containers, jar containers. Bunsen, tweezers, droppers. The materials used in this study were cotton, tissues, filter paper, and disc paper.ethanol 96%, antiseptic 70%, Aquadest, magnesium (Mg) and hydrochloric acid (HCI concentrate), mango kweni ethanol extract (Mangifera ododratagriff), 1-3 weeks old *Candida albicans* fungal culture, aluminum foil, plastic wrap. [5]

Working Procedure

1. Sampling

   The raw material for mango kweni*leaves (Mangifera ododratagriff)* was obtained from Paguyaman District, Boalemo Regency, as much as 750 g. Sampling was carried out in the morning, leaf collection was carried out by first cutting the branches of the mango kweni*plant (Mangifera ododratagriff)* that were overgrown with leaves.

   After the twigs are cut, the leaves that will be used as simplicia are selected. The leaves taken are young leaves to old leaves (not too young and not too old) then healthy and disease-free leaves (fresh leaves) are selected

   After picking the leaves, wet sorting is done by separating the leaves from each branch, the separation of leaves is done using scissors to make it easier and speed up the separation of leaves and twigs. Next, the leaves that have been separated from the branches are then washed using clean water. The washed leaves are then dried and then weighed on the weight of the wet leaves using a scale.

   After weighing, the leaves are placed in an open container. The purpose of using open containers is to make the drying process easier. Next, the container is covered using a black cloth and then dried in the sun. Cover fabrics can function to avoid direct exposure to sunlight that can damage compounds on the leaves. [6]

   The dried leaves are then sorted until dry by separating the dirt or twigs that are still left at the time of drying.

Furthermore, after dry sorting the leaves are then crushed using a blender with the aim of expanding the surface of the sample, the finer the simplisia, the greater the surface contact area with the solvent [7]

2. Sample Extraction

Mango kweni leaf powder *(Mangifera odorata griff)* is weighed and put into a maceration container, soaked with a 96% ethanol filter solution. Then the maceration container is covered with a lid coated with aluminum *foil* and soaked for 5 days at room temperature without exposure to direct sunlight. During the maceration process, the extract is stirred for 1x24 hours, so that the extract can be mixed with the solvent and accelerate the reaction between the solvent and the compounds contained in it

Next, the extract is filtered using filter paper, the extract obtained is then concentrated using a shaker to remove the solvent contained in the extract so that an extract is obtained. A shaker is a liquid stirring or shaker used in a laboratory to homogenize a substance or solution [8]

3. Confidence Screening

1. Uji Flavonoid

Leaf Extract *(Mangifera odorata griff)* A total of 0.5 g is put into a test tube and dissolved with 96% ethanol until dissolved. Filtrate is mixed with mangnesium powder (Mg) and hydrochloric acid (HCL concentrate). The formation of red, yellow, and orange colors in the mixture indicates the presence of flavonoid compounds [8]

2) ǀ Uji Chapnin

0.5 grams of kweni mango leaf extract is put into a test tube, 10 mL of hot HCL aquades is added then beaten vigorously for 10 seconds, the presence of saponins forms bubbles that do not disappear for 10 minutes [9]

3) Tannin test

0.5 g of kweni mango leaf extract was put into a test tube, then dissolved with 96% ethanol. Then 2-3 drops of FeCl are added3, the sample contains tannins when the color changes to blackish-green minutes [9]

4) Phenol

0.5 g of kweni mango leaf extract was put into a test tube and then dissolved with 96% ethanol to taste. The extract is added 1 to 2 drops of FeCl3. If a green, blue or blackish color occurs, it indicates the presence of phenols [10]

5) Steroids

0.5 g of kweni mango leaf extract was put into a test tube and then dissolved with 96% ethanol to taste. Filtrates are added to Liebermann-Buchard and diethyl ether by 2 drops. positive when producing blue or green [8]

6) Terpenoid

0.5 g of kweni mango leaf extract was put into a test tube and then dissolved with 96% ethanol to taste. Filtrates are added to Liebermann-Buchard and diethyl ether by 2 drops. positive when producing red or purple 8]

4. Preparation of Mango Leaf Extract Concentration of 2%, 4%, 6%, 8% and 10%.

The use of this concentration is based on the fact that it still uses condensed extracts. Preparation of a 2% concentration is carried out by weighing 1 g of kweni mango leaf extract dissolved

with 10 ml of aquaades. For a concentration of 4%, 1.25 g of kweni mango leaf extract was weighed dissolved with 10 ml of aquaades. The concentration of 6% weighed 1.55 g of mango kweni leaf extract dissolved with 10 ml. The concentration of 8% weighed 1.75 g of mango kweni leaf extract dissolved with 10 ml. While the concentration of 10% weighs 2 g of mango kweni leaf extract dissolved with 10 ml. [10]

5. Antifungal Activity Test
   a. Sterilization

      All equipment used for microbiological tests must be sterile so as not to be contaminated with other microorganisms. So it is necessary to sterilize the tool first by sterilizing it according to each tool and material used. Sterilization of tools is carried out by passing tools such as ose, needles and spatulas over a bunsen fire to incandescent. Sterilization for growth media, aquadests, instruments that cannot withstand high-temperature heating and precision instruments, such as measuring cups and volumetric pipettes using autoclaves at 121°C [9]

   b. PDA Media Manufacturing

      One of the good media used for fungal growth is PDA media *(dextrosa potato agar)* Because it contains quite a lot of carbohydrates, consisting of 20% potato extract and 2% glucose, thus accelerating the process of pigmentation and sporulation in mushrooms [11]

      Based on its composition, PDA is included in semi-synthetic media because it is composed of natural materials (potatoes) and synthetic materials *(Dextrose and gelatin)*, potatoes are a source of carbon (carbohydrates), vitamins and energy, dextrose as a source of sugar and energy, in addition to components that function to compact PDA media. Each of these three components is indispensable for the growth and reproduction of microorganisms, especially fungi. Fungi grow more on PDA media compared to NA media [11]

      A total of 39 g of PDA was dissolved in erlenmeyer with 1000 mL of aquadest and heated on a hot plate until everything was homogeneously dissolved. The dissolved media is sterilized in an autoclave at 121oC, the media is stored in the refrigerator as stock [11]

   c. Mushroom Rejuvenation

      Prepare to tilt the PDA on each test tube. Standard mushrooms are taken using ose that has been incandescent with fire. The mushrooms that have been taken with ose are then scratched in a zigzag manner on the surface of the medium, the mushrooms are incubated at a temperature of 37Oc for 5-7 days. The whole step of work is carried out in the water laminar *Flow* with aseptic conditions [11]

   d. Creating the *Mc. Farland Solution Turbidity Standard*

      Solution *Mc. Farland* A total of 9.9 ml of 1% H2S04 solution is added to a test tube containing 0.1 ml of 1.175% BaCl2 solution, and shaken until a cloudy solution is formed. This turbidity

is used as a standard for turbidity, suspension of test bacteria. The standard turbidity of the solution used is *Mc. Farland* No. 1, which is equivalent to 300 x 106 CFU/ml [11]

e. Suspension

Breed *Candida albicans* in the media so that the tilt is suspended with NaCl. Then it is taken in sufficient quantities and put into the seeding medium. Then it is mixed and set to turbidity equal to the solution *Mc. Farland* [11]

6. Antifungal Testing

1) The base media of the PDA is poured into a petri dish and allowed to harden.
2) On the surface of the base layer, 6 proposers are placed and arranged in such a way that there is a good area to observe the resistance zone that occurs.
3) The PDA containing the test mushroom suspension is poured into a petri dish around the prosthesis.
4) The proposer is removed from the petri dish so that a well is formed that will be used for the test solution, the positive (+) control solution and the negative control solution (-).
5) Ethanol dry sample extract test solution, ethanol wet sample extract, positive (+) control solution and negative (-) control solution were dripped.
6) Repetition is done in a triplo manner in the same way.
7) Incubated in an incubator at 370C for 1x24 hours.
8) The inhibition zones that occur around the well are then measured horizontally and vertically using a scale ruler.

E. Data Analysis Techniques

The data analysis in this study uses the SPSS Statistics test. If the data meet the requirements of the parametric test, *the One Way Anova test is used*. If the data does not meet the parametric requirements (homogeneous and normally distributed), then proceed with a non-parametric alternative test, namely Kruskal Wallis.

RESULTS AND DISCUSSION

1. Descriptive Analysis

The results of the moisture content of wet weight and dry weight weighing simplicia of Mango Kweni leaves *(Mangifera ododratagriff)* obtained a high percentage result, the complete data can be seen in table 4.1

Tabel 4.1 Hasil Kadar Air Simplisia Daun Mangga Kweni*(Mangifera ododratagriff)*

Example	Wet weight (Simplisia)	Dry weight (Simplisia)	Air Rise
Cursed *(Acoustic)*	750 grams	600 grams	20 %

Based on the data in Table 4.1, it can be seen that the results of weighing the wet weight and dry weight of the Kweni mango leaf simplicia*(Mangifera odorata griff)* Each weight is obtained as much as 600 grams of wet simplicia and for dry simplicia 750 grams with a moisture content value of 20%.

2. Extract Results

The maceration result is then calculated with the yield value to be able to find out the percentage of the number

of ingredients left. Rendetion results of ethanol extract of mnaggakweni leaves *(Mangifera odorata)* can be seen in table 4.2

Table 4.2 Results of Ethanol Extract of Mango Kweni Leaves *(Mangifera odorata griff)*

Example	Wet weight (Simplisia)	Thick Extrac Weight	Rendemen
Daun Mangga Kweni*(Mangife odorata)*	600 grams	58 grams	10 %

Based on Table 4.2, it shows the results of ethanol extract of Mango Kweni leaves *(Mangifera odorata griff)* From 600 grams of macerated dried simplicia, the weight of the thick extract was obtained as much as 58 grams, resulting in a yield value of 10%.

3. Phytochemical Screening Results

Phytochemical screening of mango leaf ethanol extract (*Mangifera odorata griff)* was tested on secondary metabolite compounds using appropriate reagents. The results of the phytochemical screening can be seen in table 4.3

Tabel 4.3 Hasil skriningfitokimiaekstrak ethanol daunmanggakweni*(Mangifera odorata griff)*

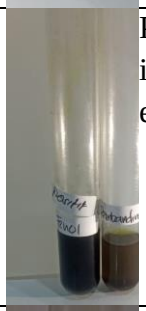
Uji skrining Fitokimia	Reagents	Reaction Results	Gambar	Ket.
Flavonoid	Mg and HCL	Orange		Positive
Saponins	HCL and Aquades	Foam Onset for 30 Secon		Positive
Tannins	FeCl3	Blackish green		Positive
Phenol	FeCl3	Blackish		Positive
Steroids	Liberman-Buchard and Dietil Ether	Blackish green		Positive
Terpenoid	Liberman-Buchard and Dietil Ether	Blackish bronze		Positive

Table 4.3 shows the tester 6 secondary metobilate compounds as antifungals from mango leaf ethanol extract *(Mangifera odorata griff)* including tests for flavonoids, saponins, tannins, phenols, terpenoids and steroids. Test each of the secondary metabolite compounds using the appropriate reagents as shown in the table. The five tests obtained positive results which were characterized by the presence of a reaction in each test of secondary metabolite

compounds.

4. Antifungal Test Results

Observation of the results of testingthe effectiveness of mango leaf ethanol extract (*Mangifera odorata griff)* against *Candida albicans* fungus was carried out by measuring each clean zone formed in each treatment using a caliper and the results can be seen in table 4.4

Table 4.4 Results of Measurement of Inhibition Zone of Mango Kweni Leaf Extract *(Mangifera odorata griff)* Against the Growth of Candida albicans Fungus

Treatment	**Rata-Rata Diameter *Candida albicans***	**Zona Hama (mm) Golongan**
Negative Control	-	Not
2 %	2.59 mm	Weak
4 %	5.83 mm	Keep
6 %	8.74 mm	Keep
8 %	10.85 mm	Keep
10 %	12.38 mm	Strong
Krontol Positive	24.65, mm	Very powerful

Table 4.4 shows the effectiveness of mango kweni leaf extract *(Mangifera odorata griff)* Fighting Fungi *Candida albicans* This can be seen in the average value of the measurement of the diameter of the resistance zone that is formed. This study consisted of 7 treatments where negative control (Aquades), concentrations of 2%, 4%, 6%, 8%, 10% and positive control *(Ketokonazole).* The average value of the diameter of the inhibition zone is categorized based on the criteria of the inhibition zone, namely weak, medium, strong and very strong. Image of inhibition of mango kweni leaf extract *(Mangifera odorata griff)* Fighting Fungi *Candida albicans* can be seen in table 4.4

2. Statistical Analysis

Table 4.5 Parametric SPSS *One-Way Anova (est results*

Normality Test

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistics	Df	Father.	Statistics	Df	Father.
	.	4	.	.	4	.
	.232	4	.	.947	4	.696
	.309	4	.	.914	4	.502
	.240	4	.	.907	4	.469
	.207	4	.	.938	4	.644
	.374	4	.	.813	4	.127
	.235	4	.	.941	4	.663

a. KoreksiSignifipsi Lilliefors

Ket. SPSS Test Results *One-Way Anova Test*

Based on parametric statistical tests *Anova One Way* Where the data results are not eligible because some have GIS values. < 0.05. So continue with non-parametric testing *Kruskal Wallis.*

Table 4.6 Non-parametric testing *of Kruskal Wallis*

Statistician Test[a,b]

	Result
Kruskal-Wallis H	14.328
Df	3
Asymp. Sig.	.002

a. Uji Salib Wallis

b. Grouping Variables: Concentration

Ket. *Kruskal Wallis non-parametric testing*

Non-parametric testing *Kruskal Wallis* and obtained a score of SIG. <0.05, then hypothesis I is accepted, namely the effect of ethanol extract from mango kweni leaves *(Mangifera odorata griff)* on the size

of the inhibition zone on fungal growth *Candida* It can be concluded that the H0 hypothesis was rejected and H1 was accepted.

Furthermore, a Duncan test was carried out to see the maximum concentration of drinking and ethanol extract of mango leaves ((Mangifera odorata griff) of 2%, 4%, 6%, 8%, and 10% *on the* growth *of Candida albicans fungus*.

Table 4.7 Results of duncan test of mango kweni leaf extract *(Mangifera odorata griff) against* Candida albicans *fungus*

Treatment	*Candida albicans* Middle	Symbol
Nagatif Control	0.00	A
Concentration 2%	2,745	B
Concentration 4%	5,830	C
Concentration 6%	8,743	D
Concentration 8%	10,850	And
Concentration 10%	12,382	F
Positive Control	24,658	G

Ket. Numbers followed by the same letter in the same column did not differ significantly, in contrast, different letters in different columns showed significant differences according to the Duncan test at a confidence level of 5% or 0.05

Based on the results of the analysis of the Duncan test on negative control, it was significantly different from the concentration of ethanol extract of mango kweni leaves *(Mangifera odorata griff)* concentrations of 2%, 4%, 6%, 8%, 10% and positive controls. The 2% concentration differed significantly from the concentrations of 4%, 6%, 8%, and 10%, respectively. Meanwhile, at a concentration of 10% there were significant differences with positive and negative controls, concentrations of 2%, 4%, 6%, and 8% and positive controls significantly different from negative controls, concentrations of 2%, 4%, 6%, 8%, and 10%.

The maximum concentration obtained is a concentration of 10% because the actual values are greater than the concentrations of 2%, 4%, 6%, and 8%. And the concentration of 2% is smaller between the concentrations of 4%, 6%, and 8% where the inhibition zone of the active substance is smaller, so its effectiveness will decrease and the inhibition zone formed will also be smaller [8]

Discussion of Research Results

Traditional medicine has existed in Indonesia since thousands of years ago, previously from the results of drying a sample of 750 grams of mango leaves *(Mangifera ododratagriff),* 600 grams of manga kweni leaf powder *(Mangifera ododratagriff)* was obtained and a moisture content of 20% was obtained. These results show that the moisture content in mango leaf simplicia (*Mangifera odorata griff)* has met the minimum requirements set by SNI. According to SNI, the permissible moisture content is 35% of the maximum limit. Moisture content can affect physical properties (hardness and dryness) and physicochemical properties, chemical changes (browning enzymes,

microbiological damage, and enzymatic changes)

Based on Table 4.2, the yield of ethanol extract of mango kweni leaves *(Mangifera odorata griff)* which yields a yield of 10%. The yield value indicates the number of compounds containing bioactive compounds contained in the extract, the higher the yield value of an extract produced, the larger the extract produced.

The results of phytochemical screening are shown in table 4.3. shows that ethanol extract from kweni mango leaves *(Mangifera odorata griff)* Tested positive for flavonid compounds because the sample changed color. "Stating that the addition of concentrated Mg and HCl powders aims to reduce the benzopyrone core so that red to orange flavillium salts are formed by flavonols or flavones, green to blue color is given by aglisone or glycosides [12]

In the saponin compound test, it showed kweni mango leaf extract *((Mangifera odorata griff)* Positive there are secondary compounds can be seen in table 4.3. The saponin test will form bubbles/bubbles for 30 seconds, by shaking the sample until it creates bubbles/bubbles for 30 seconds. It is stated that it is due to the ability of glycosides to form bubbles in water, namely the presence of hydrophile groups that bind water while hydrofobs will bind to air. The addition of HCl is necessary to increase polarity, so that the hydrophil group is more stable and the foam formed becomes stable.[9]

In the tannin compound test, the sample is poured into a test tube as much as 0.5 and then the sample is added with reagents. The reagent used was FeCl3 As many as 2 drops, there was a color change in the sample of ethanol extract of Kweni mango leaves *(Mangifera odorata griff)* to blackish-green. That the discoloration in the sample is caused by $FeCl_3$ [12] and one of the hydroxyl groups found in tannin compounds, the addition of FeCl3 which causes a blackish-green color change in the samples, thus indicating the presence of tannins.

In the testing of phenolic compounds, positive results were obtained because the sample underwent a color change from green to blackish-green. revealed that in the phenol test the sample is added with the FeCl3 reagent which can determine whether the sample contains phenolic compounds. For reagents use $FeCl_3$ [12] where it will form a blackish-green complex compound due to a hydroxyl group that reacts with Fe3+ ions

For testing steroid compounds and terpenoid samples, Liberman-Buchard reagents and diethyl ethers are added, which can cause sample changes *(Mangifera odorata griff)* becomes a blackish-green color for the presence of steroids while samples that experience a blue or purple color change the presence of terpenoid compounds. According to the word, terpenoids are compounds that have no color, are clear, taste bitter, have a high melting point and have a structure composed mostly of carboxylic acids, alcohols and aldehydes. Steroids are compounds derived from triterpenoids that are insoluble in water. [12]

Results of measurement of the inhibition zone of ethanol extract of mango kweni leaves *(Mangifera odorata griff)* Fighting Fungi *Candida albicans* can be seen

in Table 4.4. Based on the results obtained in the measurement of the diameter of the inhibition zone of each concentration of ethanol extract of mango kweni leaves *(Mangifera odorata griff)* showed a concentration of 2% of 2.59 mm, a concentration of 4% of 5.83 mm, a concentration of 6% of 8.74 mm, a concentration of 8% of 10.85 mm, and a concentration of 10% of 12.38 mm. Variations of these various concentrations have shown inhibition of fungal growth *Candida albicans*. If grouped in the category of concentration of the inhibition zone is 2% of the weak category, while the concentration of 4%, 6%, 8% medium and 10% is included in the strong category, because it has a range of 11-15 mm (strong). An increase in the concentration of the extract is followed by an increase in the content of active compounds, so the antifungal inhibition is even higher, which is characterized by an increase in the diameter of the inhibition zone.

Positive control using Ketoconazole with hamabat zone radius obtained an average value of 24.65 mm. stated that the positive control was said to be very strong because the average value was more than >20 [13] . Ketoconazole is an antifungal drug derived from imidazole that has an antifungal action that is resistant to dermatophytes, yeasts, such as Tricophyton, Epidermophyton, Microsporum, *Candida albicans*. Ketoconazole cream is used to treat dermatophyte contamination of the skin caused by *Trichopyton*and *Epidermophyton, such as Tinea corporis, crusis, and Tinea pedis.* Ketoconazole is also used to treat cutaneous candidiasis and superficial mycosis, often known as tinea pedis. For the negative control that used Aquades in this study, it did not form a clear zone because aquades did not have the ability as an antibacterial. According to Suciarti, aquades are not able to affect the growth of bacteria because aquades are neutral compounds.[14]

Based on the results that have been described, it was found that the concentration of ethanol extract of mango kweni leaves *(Mangifera odorata griff)* which shows that the lowest inhibition zone is at a concentration of 2% while the highest zone is at a concentration of 10%. This indicates that there is an increase in the resistance effect with each increase in concentration value. Putri, et al., (2024). It was stated that the concentration and the inhibition zone have a relationship, where the higher the concentration of the extract, the greater the inhibition zone formed, meaning the antifungal compound in the ethanol extract of mango kweni leaves *(Mangifera odorata griff)* at higher concentrations have a strong inhibitory power in inhibiting fungi *Candida albicans.*

The results of statistical analysis using *the Kruskal Wallis non-parametric test* showed a significant value < 0.05, so it can be said that there is an influence in the application of mango kweni leaves *(Mangifera odorata griff)* and the use of negative and positive controls on the size of the inhibition zone in the fungus *Candida albicans* or which means the conclusion of the hypothesis that Ho is rejected and H1 is accepted. Then after conducting further tests using the Duncan test, the results obtained were that there was no significant difference between one concentration and another concentration but there was a significant difference between negative control and

positive control, so it can be said that the maximum concentration of mango leaf extract *treatment (Mangifera odorata griff)* in inhibiting the growth *of Candida albicans* fungusat a concentration of 10%.

There is antibacterial/antifungal activity at each treatment concentration due to the content of antibacterial/antifungal compounds found in mango kweni*(Mangifera odorata griff.* The antibacterial compounds possessed are the result of secondary metabolites from plants stored in this part of the plant. The content of plant secondary metabolites depends on the environment in which the plant lives. According to Yeni, et al., (2021) in their research explained that in kweni mango plants *(Mangifera odorata griff)* There are antifungal compounds that have the ability to inhibit fungal growth *Candida albicans* Among them are flavonoids, saponons, tannins, phenols, steroids and terpenoids.

CONCLUSION

Based on the results of the research that has been carried out by the researcher in the previous chapter, the following conclusions can be drawn:

1. There is an effectiveness of mango leaf extract (*Mangifera odorata griff)* as an inhibitor of the growth of the fungus *Candida albicans.*
2. Mango kweni leaf extract *(Mangifera odorata griff)* with a minimum concentration of 2% obtained a result of 2,745 and the maximum in inhibiting the growth *of Candida albicans* fungus was obtained at a concentration of 10%, a yield of 12,658.

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