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Phytochemical Screening and Antibacterial Activity Test Against *Escherichia Coli* Of Porang Leaf Extract (*Amorphophallus Muelleri)* Blume) With Ethanol, Ethyl Acetate, And N-Hexane Extraction Solvents

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Abstack :The common bacteria that causes diarrhea is Escherichia coli. Therapy for Escherichia coli bacterial infection uses antibiotics but the use of antibiotics that are relatively high can cause resistance, so alternative medicines are needed using herbal medicinal plants. Based on the studies, one of the plants that can be used as an antibacterial is the porang plant (Amorphophallus muelleri Blume) which is a type of plant that has potential both technologically and commercially in terms of medical, industrial and food. This study aims to determine the content of secondary metabolites and antibacterial activity contained in porang leaf extract (Amorphophallus muelleri Blume) with 96% ethanol, ethyl acetate and n-hexane as solvents. In the antibacterial activity test using the disc diffusion method with NA media (Nutrient Agar), ciprofloxacin as a positive control, 10% DMSO as a negative control and various concentrations of 15%, 30%, 45%, and 60%. The three porang leaf extracts can produce the greatest antibacterial activity at a concentration of 60%. Antibacterial activity in the ethanol extract of porang leaves had an average inhibition zone of 1.32 ± 0.59 mm, in the ethyl acetate extract of porang leaves it had an average inhibition zone of 0.73 ± 0.10 mm, and in the n-hexane extract of porang leaves it had an average resistance zone of 0.34 ± 0.39 mm. The results of this study concluded that the three porang leaf extracts with 3 solvents had antibacterial activity but the inhibition zone formed was in the weak category.

Keywords : Amorphophallus muelleri Blume, Antibacterial, Escherichia coli, Ethanol extract 96%, Ethyl acetate extract, N-hexane extract

INTRODUCTION

Infection is one of problem in field health from time to time Keep going developing . Infection digestion is disease caused by the presence of microbes pathogens and bacteria as well as mushrooms (Sandy, 2021). Indonesia is a country with a temperate climate. tropical with condition dusty and temperature warm as well as moist so that support microbes develop breed and can cause infection . One of the disease frequent infections happen is diarrhea . diarrhea is disturbance marked defecation with more BAB from three times in a day with consistency phase liquid or thin , can accompanied by with blood and or mucus (Hasriyani , 2021). In this type diarrhea tropical incident peak occurs in the season rain . This is can happen Because Rain heavy can cause entry agent to contaminate to in water supplies and causes food become No hygienic (Cahyadi, 2020).

As one of the disease main in Indonesia, diarrhea own high incidence and mortality . According to the Ministry of Health of the Republic of Indonesia in 2016, the number death of 3.04% caused by diarrhea . Profile data Indonesian health states 2012 total case diarrhea was found around 213,435 sufferers with amount 1,289 deaths , and some large (70=80%) occurs in children under 5 years old caused by the occurrence severe dehydration , as well as the disappearance Lots fluid (Hasriyani , 2021). *Global Burden of Disease* (2018) estimates that in 2016 , diarrhea is reason death

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number eight of them all age (1,655,944 deaths) and causes death number five among children under 5 years of age (446,000 deaths) (Savira, 2021).

Reason disease diarrhea usually caused by bacteria , the most common bacteria become reason diarrhea that is *Escherichia coli* . *Escherichia coli* is Gram- negative bacteria that are capable of produce enzyme betalactamase and includes in the normal flora of the human gut , however some strains *of Escherichia coli* nature pathogen reason diarrhea (Savira, 2021). Bacteria *Escherichia coli* produce toxins that can stick and damage cells small intestine mucosa . *Escherichia coli* produce a toxin called enterotoxin Then poison This tied up in a way fast by membrane cell so that influence secretion electrolyte in the intestines which results in affected by NaCl absorption which is solution most important in body (Setiawan, 2018).

Therapy For disease infection caused by the bacteria *Escherichia coli* , namely use antibiotics . According to Minister of Health Regulation (2011) on use a relative antibiotic tall can cause problem as well as global threat to health especially resistance antibiotics . So that the need for drug alternative that is with use plant herbal medicine . The content metabolit secondary like tannins , alkaloids, terpenoids, quinones , flavonoids and polyphenols which function as agent antibacterial from a plants . The mechanism of flavonoids as antibacterial that is with denatures proteins in bacteria , terpenoids with hinder function membrane cells , alkaloids with hinder synthesis wall cell , while compound polyphenols and tannins Work with inactivation function material genetics . One of the plant drugs used that is plant (*Amorphophallus muelleri* B.) is also often called with Porang is a plants that originate from from family Araceae or taro tribe- taro tribe that can found on the ground with high water content and humus content .

In research conducted by Anisah *et al.,* (2021) use solvent ethanol 96 % extracted in a way maceration , in the section leaf detected own compound metabolit secondary such as alkaloids, tannins and steroids. While in the part stem only contains alkaloids and tannins with existence content compound metabolit from stem and leaves porang can used as antibacterial . According to research that has been conducted by Suganda *et al.,* (2021) in a study conducted using boiled water leaves and stems porang , where results study show that boiled water leaves and stems porang own ability hinder growth colony *P. oryzae* with inhibition highest by 30.6% by boiled water stem 5% concentration . Inhibition highest to germination conidia , namely of 60.6% was also shown by the boiled water treatment stem porang 5%. Research antibacterial on the part tuber show average diameter of inhibition zone as much as 10.5mm with response obstacle strong (Istiqomah , 2021).

Election solvent used can influence results extraction . In the research conducted by Sumitriasih *et al.,* (2019) used different solvents show activity antibacterial wood ebony n- hexane extract No existence response resistor to bacteria whereas extract ethanol has an average inhibition zone of 23.78mm and ethyl acetate 26.14mm, activity the most powerful antibacterial found in the extract ethyl acetate with response obstacle very strong . In the study English *et al.,* (2021) showed n- hexane extract No inhibition zone formed , extract methanol with concentrations of 120% and 140% have the average value is (13.8 mm and 14.1 mm) while extract ethyl acetate with concentrations of 120% and 140% have average value of (11.7 mm and 12.3 mm). In the research of Ramadhani *et al.,* (2020) the fraction ethyl acetate leaf

clove have inhibition zone the largest , namely 17.41 mm, extract ethanol have inhibition zone of 16.07 mm and the n- hexane fraction only have inhibition zone of 13.6.

Election solvent for the maceration process will give high effectiveness with notice solubility compound material natural in solvent the principle . solubility used is *like dissolve like* It means polar solvents will dissolve polar compounds and non-polar solvents will dissolve non-polar compounds (Septyaningsih , 2010). Compounds metabolit secondary own different polarities , such as alkaloid compounds have nitrogen bases on the chain its cyclic and contains diverse substituent so the alkaloids are semi-polar, tannins including group polar polyphenols , flavonoids have group hydroxyl which is not substituted so that polar in nature , saponins have glycosyl function as polar groups and steroid groups as nonpolar groups (Gupita , 2012; Sangi *et al* ., 2008; Putri et *al* ., 2013). Terpenoids have nonpolar and polar parts . Terpenoids are composed of from chain long C30 hydrocarbons which cause its nature is nonpolar (Taofik *et. et al* ., 2010).

One of methods used in antibacterial testing is method diffusion disc which is the most common way used For test sensitivity bacteria to various type drugs . This method done with put disc containing antibacterial to diffuse into agar media (Pratiwi , 2008). Clear area around disc show existence obstacle growth microorganisms by agents antibacterial (Maradona, 2013).

Based on background behind on Still lack of research that uses solvent different to activity antibacterial from extract leaf porang because That researcher want to do study about testing activity antibacterial use method diffusion disc from extract leaf porang with solvent ethanol 96%, ethyl acetate , and n- hexane . Uses different solvents expected can interesting compound metabolit different secondary on each solvent and produce activity different antibacterials .

RESEARCH METHODS

Design study This is experiment for real *(true experimental design)* that was carried out in a way qualitative and quantitative . The purpose of study experimental qualitative that is For know compound metabolit secondary contained in leaf porang (*Amorphophallus muelleri)* B. *)* on variations polar solvent (ethanol 96%), semi-polar (ethyl acetate), and nonpolar (n- hexane). While study experimental quantitative done with Study experimental used For give a treatment to sample . Design applied research for activity test antibacterial in study This is *post test only group design* with using 18 treatments . Research This use design Completely Randomized Design (CRD) with using 6 treatments in each type solvent , namely : In research This methods used covering determination plants , collection sample , preparation powder simple drug , extraction sample with method maceration , evaluation extract , screening phytochemicals to test sample , manufacture extract test solution 96% leaf ethanol porang , extract test solution ethyl acetate leaf porang and n- hexane extract test solution leaf porang with each concentrations of 15%, 30%, 45%, and 60%, testing activity antibacterial extract 96% leaf ethanol porang , extract ethyl acetate leaf porang and n- hexane extract leaf porang to bacteria *Escherichia coli* done with use method diffusion disc For measure

the inhibition zone of each concentration , control positive , and control negative . Data was analyzed using *One Way* ANOVA.

1. **Location and Time of research**

Research location is location a study will conducted . Research conducted at the Bali International University Laboratory , Laboratory Integrated Faculty Mathematics and Science Knowledge Udayana University Nature Laboratory , and Mahasaraswati University Chemistry Laboratory . Research This done in the month December 2022 to May 2023.

2. **Scope Study**

Scope study This is including in study material nature , especially in the manufacture of extract along with test . In the study This materials used is leaf porang (*Amorphophallus muelleri* Blume).

3. **Determination Data source**

a. Plant Identification

Natural materials used in study This is leaf plant porang (*Amorphophallus muelleri* Blume) which grows in the Penatahan , Penebel , Tabanan areas. For ensure plants used already Correct so done identification determination at the National Research and Innovation Agency (BRIN).

b. Sample

Sample in study This is leaf from plant porang (*Amorphophallus muelleri* Blume) with long about 40-80 cm, color green , fresh and not rotten .

4. **Variables Study**

1. *Independent* Variable

Variables free on research This is extract leaf porang (*Amorphophallus muelleri)* Blume) with variation solvent . The solvent used that is ethanol 96% (polar), ethyl acetate (semi-polar), and n- hexane (nonpolar).

2. Dependent Variable

Variables bound in study This that is compound metabolit secondary and activity antibacterial extract leaf porang (*Amorphophallus muelleri)* Blume) which is shown with the presence of an inhibition zone formed .

3. Controlled Variable

Variables controlled in research This is size sliced leaf porang (*Amorphophallus muelleri)* Blume), time extraction and temperature drying .

5. **Definition Operational**

As for the definition operational from variables in study This as following :

1. Porang leaves (*Amorphophallus muelleri)* Blume) which is used leaf colored green and still fresh ready harvested growing around Extract ethanol 96%, extract ethyl acetate , and n- hexane extract leaf porang is results extraction leaf porang with filter ethanol 96%, ethyl acetate and n- hexane use method maceration Then concentrated use *rotary evaporator* .
2. Activity antibacterial extract ethanol 96%, extract ethyl acetate , and n- hexane extract leaf porang (*Amorphophallus muelleri)* Blume) in hinder bacteria *Escherichia coli* is a clear zone which then measured with use term push in millimeter (mm) units .
3. Screening phytochemicals or content test compound metabolit secondary from extract ethanol 96%, ethyl acetate , and n- hexane from leaf porang .

6. **Research Materials and Tools**

1. Research Materials

main materials used in the research This is leaf porang (*Amorphophallus muelleri)* Blume) which was taken leaf colored fresh green ready harvested grow around Extraction material maceration used in research This is For get extract leaf porang (*Amorphophallus muelleri)* Blume) with ethanol 96%, ethyl acetate and n-hexane . Screening test materials phytochemicals that are carried out in a way qualitative with test flavonoids , tannins, saponins, alkaloids, steroids and terpenoids. The materials used namely 10% sodium hydroxide , 10% iron (III) chloride , 10% acid chloride 0.1N, acid chloride 2 N, solution Dragendorff , solution chloroform , acid sulfate 2 N, reagent mayer , reagent wagner , and reagents Leiberman -Burchard. Materials used in activity test antibacterial in research This is *Nutrient Agar* (NA), control positive (ciprofloxacin), control negative (DMSO). Activity test antibacterial extract ethanol 96%, extract ethyl acetate , and n- hexane extract leaf porang (*Amorphophallus muelleri)* Blume) uses bacteria *Escherichia coli.*

2. Research Tools

Tools needed for research This is petri dish , needle ose , blender, tube reaction , Erlenmeyer, glass beaker , glass measuring cup , Bunsen, lighter , autoclave , oven, incubator , digital scale , spatula, *rotary evaporator* , knife , aluminum foil pipe , cotton , stove , *paper disk* , and book notes .

7. Procedure Study

1. Plant Determination

Determination plant leaf porang (*Amorphophallus muelleri)* Blume) was conducted at the National Research and Innovation Agency Conservation Center Plant Eka Karya Botanical Gardens Bedugul- Bali.

2. Making of Simple Powder

Porang leaves (*Amorphophallus muelleri)* Blume) which is used is leaf porang that is whole , fresh, not rotten , and taken direct from tree Then collected . How to process it as following :

1. Sorting Wet
   Collected as much as 41.2 kg of leaves fresh porang then separated from stalks and remains dirt or object foreign like soil , gravel , and leaves that have damaged until clean .
2. Washing
   Washing leaf porang (*Amorphophallus muelleri)* Blume) was performed with flowing water , washed until clean and dried with method placed in place open with circulation good air and not caught ray sun in a way direct .
3. Trimming
   Trimming done with cut small-small leaf porang use knife . Slicing done For speed up the drying process . Weigh the ingredients before done drying .
4. Drying
   After slicing , the leaves dried with method aired Then to be continued using an oven at a temperature of 50 ^{o} C is done during One day . In general temperature For to dry material simple is in the range of 30 ^{o} C-90

º C, but temperature best No more from 60 º C. Drying done using the oven because it's hot even and stable . Drying aiming For lower water content in material so that microorganisms harm No growing (Warnis et al., 2020).

5. Pollination
   After the drying process , weigh it simplification leaf porang and puree simple using a blender. Powder sifted herbal medicine with 40 mesh sieve .

3. Evaluation of Porang Leaf Simplex

In obtaining good simple must be noticed parametersparameters as following :

1. Organoleptic
   Covers use five senses For describe form (solid , powder , dry , thick , liquid) color (yellow , brown , etc.), odor (aromatic , not smelly , odorous), taste (bitter , sweet , chelate) of simple leaf porang . With objective For introduction simple beginnings (Ministry of Health of the Republic of Indonesia, 2020).
2. Percentage Yield
   Yield simple counted based on comparison heavy end with heavy early (weight material wet used) multiplied by 100 %. Calculation percentage yield with use formula (Ministry of Health of the Republic of Indonesia, 2020).

$$\%\text{Rendemen} = \frac{\text{bobot tanaman akhir (gram)}}{\text{bobot tanaman awal (gram)}} \times 100\ \%$$

3. Shrinkage Drying
   Shrinkage parameters drying is remainder substance after drying at a temperature of 105 º C for 30 minutes or until heavy constant , which is stated mark percent . Shrinkage parameters drying basically is measurement remainder substance after drying at a temperature of 105 º C until heavy constant , which is stated as mark percent (Ministry of Health of the Republic of Indonesia, 2000). Calculated with formula following :

$$\%\ \text{Penyusutan} = \frac{\text{berat sampel sebelum pemanasan} - \text{berat akhir}}{\text{berat akhir}} \times 100\ \%$$

4. Extract Making

Making extract leaf porang (*Amorphophallus muelleri* Blume) is done with method maceration or immersion . The purpose of election method maceration that is Because method the workmanship and equipment used simple and not damage compounds that are not stand hot . Powder leaf porang dry mixed to in each solvent that is ethanol 96%, ethyl acetate and n- hexane , with ratio 1:5. Powder leaf porang dry weighed as much as 1 kg, then added solvent as much as 5 L is mixed into the each jar . After that homogenized for the maceration process .

Maceration process This done with keep quiet mixture powder with solvent in jar for 3 days in place dark while once in a while stirred (every 6 hours). After 3 days , the results maceration filtered use paper filter For separate solution with sediment . Sediment maceration done maceration return with 2 L of solvent until submerged ,

soaking and filtering done for 3 days . Obtained macerate Then combined , the solution results evaporated or evaporated during not enough more than 2 hours for get extract pure from leaf porang . Evaporation process This use a tool called *rotary evaporator* . After evaporation , then produced extract pure in the form of colored paste green blackish .

5. Evaluation of Porang Leaf Extract

In research This to obtain good extraction must be noticed parametersparameters as following :

1. Organoleptic
2. Covers use five senses For describe form (solid , powder , dry , thick , liquid) color (yellow , brown , etc.), odor (aromatic , not smell , odor), taste (bitter , sweet , chelate). With objective For introduction humble beginnings extract leaf porang (Ministry of Health of the Republic of Indonesia, 2020). Percentage Yield

   Extract yield counted based on comparison heavy end (weight) the resulting extract) with heavy early (weight biomass cells used) multiplied by 100 %. Calculation percentage yield with use formula (Ministry of Health of the Republic of Indonesia, 2020).

$$\%\text{Rendemen} = \frac{bobot\ ekstrak(g)}{bobot\ sampel\ awal\ (g)} \times 100\%$$

3. Water content

   Testing water level is done with use method gravimetry . The method done with method weigh not enough more than 10 g sample of 42 leaves porang into the container that has been ditara . Dry at 105 ° C for 5 hours and then weighed . Continue drying and weighing on the hose 1 hour to go difference between two weighing consecutive No exceeding 0.25% (Indonesian Ministry of Health , 2020).

$$\text{Kadar Air} = \frac{W1-W2}{W1-W0} \times 100\%$$

   Keterangan:

   W0 = bobot cawan kosong (g)
   W1 = bobot ekstrak + cawan (g)
   W2 = bobot ekstrak + cawan setelah dikeringkan (g)

4. Ash Content

   Glow crucible silicate before used and weighed crucible silicate that has incandescent . Then Weigh 2 g of sample and put it in into the crucible silicate empty . Incandescent slowly at a temperature of 600 ° C until sample become ash in furnace electricity . Next crucible silicate cooled and then weighed until to obtain constant weight . Total ash content is calculated to weight powder beginning in %b/b. Calculation level total ash can counted with formula following (Sahara et al, 2021).

$$\text{Kadar Abu} = \frac{W1-W2}{W} \times 100\%$$

Keterangan:

W = bobot sampel sebelum diabukan (g)
W2 = bobot cawan kosong (g)
W1 = bobot sampel + cawan sesudah diabukan (g)

5. Acid Insoluble Ash Content

Solution ash used determination level ash with Add 25 ml of 10% HCl and boil for 5 minutes , collect the part that is not late in acid , 43 strain with use paper filter free ash , wash with hot water . Residue and crucible filter incandescent until obtained weight still . Then level the ashes that are not late sour counted to heavy the stated test material in % w/w. Ash late high acid indicates existence dirt or sand (Sudarmadji et al., 2007).

6. Antibacterial Activity Data Collection Technique With Inhibition Zone

Effectiveness antibacterial compound extract leaf porang seen from the inhibition zone obtained . In the inhibition zone shown with looks more clear from the area surrounding and not overgrown bacteria . Measurement of inhibition zones measured use term push with unit millimeters (mm).

As for the formula inhibition zone calculation as following :

$$\frac{a+b+c}{3} - D \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

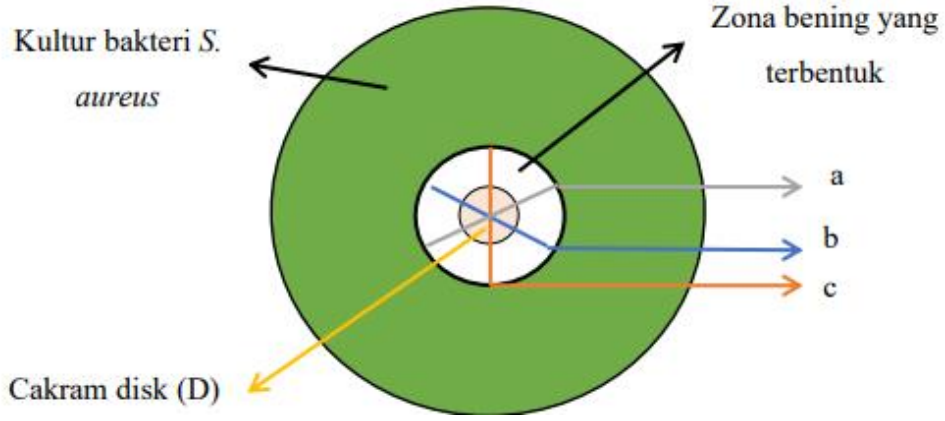

Figure 4.2 Measurement of Inhibition Zone Diameter

a : Diameter A
b : Diameter B
c : Diameter C
D : Disc diameter

7. **Data analysis**

Research conducted that is screening phytochemicals extract ethanol 96%, ethyl acetate and n- hexane from leaf porang , and continued with activity testing antibacterial to bacteria *Escherichia coli* . Obtained results screening phytochemicals from leaf porang tested in a way descriptive . Obtained activity test results antibacterial from each extract leaf porang and get it existence difference solvent in extraction to activity antibacterial . After getting results from testing activity extract ethanol 96%, extract ethyl acetate and n- hexane extract leaf porang (*Amorphophallus*

muelleri) Blume) against bacteria *Escherichia coli* , results the Then analyzed and carried out data processing with using statistical tests *One Way* ANOVA for see significance of inhibition zones in each group extract .

Data first formerly analyzed using normality test For know normality data distribution using *Kolmogoriv -Smirnov Test* via the SPSS program. If mark a variable more big from *level of significance is* 5% (> 0.050) then this variable normally distributed , whereas If mark a variable more small from *level of significance* 5% (< 0.050) then No distributed normally .

To be continued with homogeneity as prerequisite data analysis before Conduct *One Way* ANOVA test . Homogeneity test aiming For know does the data have the same variation . If mark significant homogeneity test small from α, then its variants it is said No same . If mark significant more big from α, then its variants it is said The same .

Then If results from the normality test normally distributed and homogeneity test variation population same , then to be continued with analysis comparative data between group using the *One Way Analysis of Variance* (ANOVA) test then LSD (*Least Significantly Different*) test was conducted to know different groups significant . The results of *the One Way* ANOVA and LSD tests are said to be significant when R value <0.05 with level 95% test confidence .

RESEARCH RESULT

1. Identification Results Porang Leaf Plant (Amorphophallus muelleri B.)

Based on determination plants conducted at the National Research and Innovation Agency Conservation Center Plant Eka Karya Botanical Gardens Bedugul-Bali. Determination plant porang done For ensure truth identity plants used in research and avoid existence error in taking sample (Hamad *et al.,* 2017). Identification results leaf porang used in study This own Name scientific as following :

Kingdom : *Plantae* (Plants)
Subkingdom : *Tracheobionta* (Plant vascular)
Superdivision : *Spermatophyta* (Produces seed)
Division : *Magnoliophyta* (Plants) flowering)
Class : *Liliopsida* (In pieces One or monocotyledons)
Order : *Alismatales R.*
Family : *Araceae* Juss
Genus : *Amorphophallus* Blume ex Decne .
Type : *Amorphophallus muelleri* Blume

2. Results of Simple Porang Leaves (*Amorphophallus muelleri)* B.)

In the research This use leaf from plant porang (*Amorphophallus muelleri)* Blume) which was taken from Penatahan Village , Penebel , Tabanan, Bali. The porang leaves used colored leaves green , still fresh, and not perforated . Porang leaves that have harvested the dissorted For remove leaves that are not worthy or rotten , the results obtained as much as 41.2 kg of leaves Fresh porang . Porang leaves washed using water and draining until No there is water left , then chopped For speed up the drying process . Porang leaves dried moreover formerly before entered to in the

oven with temperature 50 ° C. after being ovened sorting dry For remove impurities that are still left behind in the herbal medicine . Porang leaves that have been dry Then refined use tool grinding and sifting use 40 mesh sieve . Powder simple leaf porang obtained as much as 5.7 kg.

3. Evaluation Results Simple Porang Leaf (Amorphophallus muelleri Blume)

Evaluation results simple leaf porang (*Amorphophallus muelleri)* Blume) conducted in the study This including organoleptic tests , percentage yield , and shrinkage drying .

a. Organoleptic Test

Based on results evaluation powder simple leaf porang (*Amorphophallus muelleri)* Blume) was performed with method take sample enough Then done observation to shape , aroma, taste and color from simple leaf porang (*Amorphophallus muelleri)* Blume). Organoleptic test results simple leaf porang presented in Table 5.1.

Examination Results Organoleptic of Porang Leaves

Observation Organoleptic	**Check up result**
Form	Dried leaves
	Leaf specialties porang
Flavor	Bitter
Color	Green

b. Percentage Yield

Percentage yield is mark percentage comparison between weight material dry (output) against weight wet (when harvest) which is stated in percent (%). Percentage value yield simple leaf porang (*Amorphophallus muelleri)* Blume) is 13.83% obtained from comparison weight material dry 5.7 kg with weight wet 41.2 kg.

c. Drying Shrinkage

Testing shrink dryer aiming For give limitation maximum the magnitude compounds lost during the drying process . Shrinkage test value drying simple leaf porang (*Amorphophallus muelleri)* Blume) can seen in Table 5.2. **Table 5.2 Shrinkage Results Drying Porang Leaves**

Sample	Shrinkage Drying (%)	Library
Simple Porang Leaf	8.40%	Condition No more or The same with 10%

Shrinkage test value drying obtained from simple leaf porang namely 8.40%, where results shrink drying simple leaf porang (*Amorphophallus muelleri)* Blume) meets condition that is No more from 10%.

d. Porang Leaf Extract Results (Amorphophallus muelleri B.)

In the research This use method maceration with ratio 1:5 (w/v). Powder leaf porang (*Amorphophallus muelleri)* Blume) which has sifted , weighed as much as 1 kg is entered to in jar and added solvent ethanol 96%, ethyl acetate , and n- hexane, each as much as 5 L to in different jars . Maceration done for 3 times 24 hours and stirred every 6-8 hours at room temperature room . Solution the Then filtered so that obtained Filtrate I and residue in the form of dregs . Residue results macerated for 3

times 24 hours with add 2.5 L of solvent , after That filtered so that obtained Filtrate II. The results of filtrate I and filtrate II are combined. Then filtered use paper filter . The filtrate obtained concentrated with use tool *rotary evaporator* at a temperature of 50 ° C, until obtained extract thick . Extract the thickness obtained weighed and counted presentation yield . Obtained results presentation yield extract ethanol 96%, ethyl acetate , and n- hexane leaf porang consecutive that is 100 grams , 82 grams, and 34 grams.

e. Evaluation Results Porang Leaf Extract (Amorphophallus muelleri Blume)

f. Organoleptic Test Results Porang Leaf Extract (Amorphophallus muelleri Blume .)

In organoleptic testing done with method take sample enough Then done observation to shape , aroma, taste and color from extract leaf porang (*Amorphophallus muelleri)* Blume.). Organoleptic test results extract leaf porang presented in Table 3.

Examination Results Organoleptic Porang Leaf Extract

Extract	Extract thick			
	Form	**Color**	**Smell**	**Flavor**
Ethanol 96%	Extract thick	Deep green	Distinctive odor leaf porang	Bitter
Ethyl Acetate	Extract thick	Deep green	Distinctive odor leaf porang	Bitter
n- Hexane	Extract thick	Deep green	Distinctive odor leaf porang	Bitter

g. Percentage Results of Yield Level Porang Leaf Extract (Amorphophallus muelleri B.)

Presentation yield obtained based on results making extract leaf porang is weighed and its % yield is calculated as following .

Table 5 Results of Water Content Test of Porang Leaf Extract

Solvent	Weight Simplex (gram)	Weight Thick Extract (grams)	Yield (%)
Ethanol 96%	1000	100.36	10,036
Ethyl Acetate	1000	82.28	8,228
n- hexane	1000	34.08	3,408

h. Water Content Test Results of Porang Leaf Extract (Amorphophallus muelleri B.)

Water content is a parameter for set water residue after the drying process . The water content obtained in the simplicia and extracts is respectively in accordance with with condition quality namely ≤ 10%. Determination water content is also related with purity extract . Too much water content high (> 10%) causes growth

microbes that will lower stability extract . (Ministry of Health of the Republic of Indonesia, 2000). Results of the water content test of the extract thick leaf porang (*Amorphophallus muelleri)* Blume.) can seen in Table 5.5

Table 5 Results of Water Content Test of Porang Leaf Extract

Solvent	Water content (%)	Library
Ethanol 96%	9.12	Condition water content ≤ 10%
Ethyl Acetate	6.61	
N- hexane	9.47	

content tests on extracts ethanol leaf porang namely 9.12%, extract ethyl acetate leaf porang namely 6.61%, and n- hexane extract leaf porang which is 9.47%. The results obtained has fulfil The requirements for water content testing are: not enough or The same with 10%.

i. Total Ash Content Test Results of Porang Leaf Extract (Amorphophallus muelleri Blume)

Total ash content is calculated to heavy test material , stated in % b/b (Utami *et al.,* 2017). Ash content is the remaining residue when a sample burned perfect in furnace ashing . The purpose of this is testing level ash For give description level contamination by contaminants in the form of compound inorganic (Sahara *et al.,* 2021). Obtained results level ash extract leaf porang (*Amorphophallus muelleri)* Blume) can seen in Table 6

Table 6 Results of Total Ash Content Test of Porang Leaf Extract

Solvent	**Total Ash Content (%)**	**Library**
Ethanol 96%	6.34	Ash content extract thick No may more from 3.9% to 17.4%
Ethyl Acetate	7.50	
n- Hexane	8.57	

Test results ash extract ethanol leaf porang obtained 6.34%, extract ethyl acetate obtained 7.50%, and n- hexane extract leaf porang obtained 8.57%, where level the ash obtained from the results assay analysis ash fulfil condition Because No results level the ash obtained No more from 17.4%.

j. Results of Acid Insoluble Ash Content Test of Porang Leaf Extract (Amorphophallus muelleri Blume)

The height level ash No late in sour show existence content silicate originating from from land or sand , soil and elements metal silver , lead and mercury (Utami *et al.,* 2020). Ash content No late sour reflect existence mineral contamination or metal that is not late sour in a product . In the content test ash No late acid that has been done obtained results level ash No late sour extract leaf porang (*Amorphophallus muelleri)* Blume) as following .

Table 5.7 Results of Acid Insoluble Ash Content Test of Porang Leaf Extract

Solvent	**Total Ash Content (%)**	**Library**
Ethanol 96%	0.017	Condition level ash No late sour No more or The same with 0.7%
Ethyl Acetate	0.017	
n- Hexane	0.080	

From the results testing level ash No late the acid obtained results level ash No late sour extract ethanol and extract ethyl acetate which is 0.017 and the result from n- hexane extract which is 0.080 where third extract leaf porang Already fulfil condition level ash No late sour Where the results obtained No more from 0.7%.
From the results testing activity antibacterial extract 96% leaf ethanol porang to bacteria *Escherichia coli* control positive own strength antibacterial very strong with an average diameter of 40.48mm, control negative and concentration 15%, 30%, 45% no produces an inhibition zone in bacteria , a concentration of 60% produces an inhibition zone where is the inhibition zone that is with an average of 0.34 mm where response obstacle classified as weak .

CONCLUSION

Based on results research that has been done previously , then can concluded as following :

1. Extract leaf porang with solvent ethanol 96% can dissolve compound metabolit secondary in the form of flavonoids, tannins , and saponins, and extracts leaf porang with solvent ethyl acetate can dissolve compound metabolit secondary in the form of flavonoids, tannins , saponins, and steroids. While extract leaf porang with n- hexane solvent only capable dissolve compound metabolit secondary in the form of flavonoids and steroids.
2. In the extract leaf porang (*Amorphophallus muelleri)* Blume.) with solvent ethanol 96% has activity antibacterial to bacteria *Escherichia coli* at concentrations of 30%, 45%, and 60% with category of inhibition zone diameter that is classified weak .
3. In the extract leaf porang (*Amorphophallus muelleri)* Blume.) with solvent ethyl acetate own activity antibacterial to bacteria *Escherichia coli* at concentrations of 30%, 45%, and 60% with category of inhibition zone diameter that is classified weak .
4. In the extract leaf porang (*Amorphophallus muelleri)* Blume.) with n- hexane solvent own activity antibacterial to bacteria *Escherichia coli* at a concentration of 60% with category of inhibition zone diameter that is classified weak .
5. There is difference meaningful activity antibacterial in extract leaf porang with solvent ethanol 96%, ethyl acetate , and n- hexane .

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