Utilization Of Buas Buas Leaf (*Premna Pubescens Blume*) Ethanol Extract As Liquid Soap With Anti-Bacteria Activity

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Abstract
*The buas buas (*Premna pubescens *Blume) plant is from the Lamiaceae family. The use of ethanol extract of buas buas leaf (*Premna pubescens *Blume) as soap is because soap is one of the health products needed by many people to maintain a healthy body. It is used as an antibacterial because buas buas leaves contain secondary metabolites that can be used as antibacterial.The Buas buas leaf Simplicia (*Premna pubescens *Blume) was extracted using 96% ethanol by maceration and concentrated with a rotary evaporator to evaporate the solvent. The concentrated extract obtained was tested by phytochemical screening, formulated into liquid soap with concentrations of 5%, 10%, 15% and tested for pH, foam height, viscosity, specific gravity and irritation test, and antibacterial activity against staphylococcus aureus bacteria. The results of the phytochemical screening test of the ethanol extract of buas buas leaf (*Premna pubescens *Blume) contained secondary metabolites in the form of alkaloids, flavonoids, saponins, tannins and steroids/triterpenoids. Liquid soap made with concentrations of 5%, 10%, and 15% has a pH of 10-10.3; foam height 50-90 mm; viscosity 1210-1290 cP; specific gravity 1-1.08 and did not cause irritation to volunteers; and have inhibitory power of 14.2 mm, 15.0 mm, 16.0 mm, and 20.0 mm against Staphylococcus aureus bacteria, respectively.*

Keywords: *Phytochemical screening, liquid soap, antibacterial, Staphylococcus aureus, Premna pubescens Blume.*

I. INTRODUCTION

Diseases due to infection can be treated with the use of appropriate antibiotics. The widespread use of antibiotics in the community needs to be aware of the phenomenon of microorganism resistance to certain antibiotics circulating in the community. This encourages the importance of finding sources of antimicrobial drugs that can overcome various problems that arise in antibiotic therapy, especially those from plants. (Prasetyawan, 2011).One of the plants that have the potential as medicine and has not been widely used in Indonesia are wild plants. The use of this plant is still very limited to the Malay community; wild beasts are used as fresh vegetables or vegetables that are used as a mixture in the typical Malay food, namely spicy porridge, which is usually consumed during the month of Ramadan (Restuadi, 2015).

(a) (b)

Fig 1. (a) Plant, (b) Leaf of Buas buas (*Premna pubescens* Blume)

Buas buas are plants with a shrub habitus whose habitat lives in forests and yards with a height that can reach 3-10 meters. This plant is branched by having a long oval leaf shape and has many leaflets. This plant has white flowers in the form of capsules 1 cm long and about 8 cm wide and has many round seeds. (Wahyuni et

al., 2014). The buas buas plants produce metabolites used to defend from nuisance organisms or as protection for these plants. In contrast, due to bioactive compounds, humans can also use these secondary metabolites as medicinal ingredients. The leaves of this plant can be consumed and efficacious as medicine. Buas buas leaves have a distinctive smell and taste, so they are thought to have a relatively high secondary metabolite content (Mia et al., 2014).

Buas buas plants have properties as traditional medicines that can cure various diseases such as colds, eliminate bad breath, overcome intestinal worm infections, increase breast milk and can refresh a woman's body after giving birth by mixing a decoction of leaves, roots, bark, and stems into women's bathwater (Saim, 1992).

The ethanol extract of buas buas leaves contains alkaloids, flavonoids, steroidal saponins and tannins. The activity test against Staphylococcus aureus gave an inhibition zone of 11 mm with a moderate category at a concentration of 90% (widyaastuti, 2017). Antifungal solid soap ethanol extract of buas buas leaf at concentrations of 5% and 15% gave inhibition zones of 18.3 mm and 21.5 mm. (Fitriarni, 2017).Soaps are sodium and potassium salts of fatty acids derived from vegetable oils or animal fats. Soap is a product that can be used to clean and remove dirt on the skin. Soap used as a cleanser can be solid (hard), soft and liquid. Liquid soap has the advantages of practical form, tightly closed packaging and is not easily contaminated compared to solid soap. The disadvantage of liquid soap is that it is relatively expensive sometimes; it is wasteful to use it.

II. METHOD

2.1 Sampling

The sample was taken from Meranti Paham Village, Panai Hulu District, Labuhan Batu Regency, North Sumatra Province.

2.2 Materials

The materials used in this study were buas buas extract, aquadest, 96% ethanol, magnesium powder, concentrated HCl, 10% iron (III) chloride, 2N HCl, Libermann-Bourchard reagent, Bouchardat reagent, Mayer's reagent,Dragendorff's reagent, KOH (potassium hidroksida), As.stearat, SLS (sodium lauril sulfat), water, VCO (virgin coconut oil), HPMC (hydroxypropyl methylcellulose), BHT (butylated hydroxytoluene), Gliserin, Oleum sakura, MHA (Muller Hinton Agar), NaCl 0,9% solution.

2.3 Extraction

Buas-buas leaf powder (*Premna pubescens* Blume) is weighed as much as 500 grams; put the buas-buas leaf powder into a vessel, add 96% ethanol solvent, then the container is closed and then allowed to stand for five days in a place protected from light and moisture, the pulp is rewashed with 96% ethanol for five days. 2 days later filtered (Depkes RI, 1979).The ethanol extract of buas buas leaf was concentrated with a rotary evaporator at a temperature of 70°C and then evaporated at a temperature of 60°C until a thick extract was obtained.

2.4 Phytochemical Screening Test

2.4.1 Alkaloid Examination

HCl 2 N added 9 ml distilled water, then heated on a water bath for 2 minutes, cooled and filtered the filtrate was used for the examination of alkaloids:

1. Three drops of filtrate are added with two drops of Mayer reagent, a white or yellow lumpy residue will be formed.
2. Three drops of filtrate are added with two drops of Bouchard at reagent, a brown to black residue will be formed.
3. Three drops of filtrate are added with two drops of Dragendroff reagent to form brown or orange.

Three drops of filtrate are added with two drops of Dragendroff reagent to form brown or orange (Ditjen POM, 1979).

2.4.2 Flavonoid Examination

Buas-buas leaf ethanol extract was weighed 0.5 g, added 1 ml. As much as 10 g of Buas-buas leaf ethanol extract was weighed and then added 100 ml of hot distilled water, boiled for 5 minutes and filtered in a hot state, into 5 ml of the filtrate added magnesium powder and 1 ml of concentrated HCl and 2 ml of amyl alcohol, shaken vigorously and allowed to separate. The presence of flavonoids is indicated by the presence of a red, yellow or orange colour on the amyl alcohol layer (Ditjen POM, 1979).

2.4.3 Saponin Examination

As much as 0.5 g of Buas-buas leaf ethanol extract was put into a test tube, then added 10 ml of hot distilled water and cooled, then shaken vigorously for 10 minutes. If the foam is formed with a height of 1-10 cm, which is stable for not less than 10 minutes and does not disappear with the addition of 1 drop of 2 N HCl, it indicates the presence of saponins. (Ditjen POM, 1979).

2.4.4 Tannin Examination

As much as 1 g of Buas-buas leaf ethanol extract with 10 ml of distilled water and then filtered the filtrate was diluted with distilled water until it was colourless. Took two ml of the solution, and added 1-2 drops of 1% iron (III) chloride reagent. If a blue-black or green-black colour occurs, it indicates the presence of tannins. (Ditjen POM, 1979).

2.4.5 Steroid/Triterpenoid Examination

The steroid/triterpenoid test when the Liberman-Bouchard at reagent was added gave a green colour indicating the presence of a class of steroid/triterpenoid compounds .A total of 1 g of Simplicia powder was macerated in 20 ml of n-hexane for 2 hours and then filtered. 5 ml of filtrate was evaporated in an evaporating dish to dryness. To the residue was added 20 drops of anhydrous acetic acid and one drop of concentrated sulfuric acid (Lieberman-Bouchard reagent). Colour formation. If a purple or red colour is formed, which then changes to blue or blue-green, it indicates the presence of steroids/triterpenoids. (Harborne, 1987).

2.5 Formulation and Procedure for Making Liquid Soap

2.5.1 Buas-Buas Leaf Ethanol Extract Liquid Soap Formula

In this study, liquid soap preparations were made with variations in different extract concentrations, namely concentrations of 5%, 10%, and 15%. Based on the standard liquid soap base, a 100 gram liquid soap formulation with three concentrations was made, namely as follows:

Table 1. The formulation of 100 gram gel with three concentrations

No	Materials	F0 (%)	FI (%)	FII (%)	FIII (%)
1	Buas-buas leaf ethanol extract	0	5	10	15
2	VCO	25	25	25	25
3	KOH	6,85	6,85	6,85	6,85
4	Stearic acid	5	5	5	5
5	SLS	5	5	5	5
6	Glicerin	5	5	5	5
7	HPMC	2	2	2	2
8	BHT	0,05	0,05	0,05	0,05
9	Sakura oil	0	1	1	1
10	Water until	100	100	100	100

2.5.2 Making Buas-Buas Leaf Ethanol Extract

Put 25 ml of VCO into the beaker glass, then add various extracts of buas buas leaf according to the concentration, stir until homogeneous. Added KOH little by little while heating at 50℃ to get a soap mass. Then add distilled water (± 25 ml), then add HPMC, which has been developed with aqua dest and stir until

homogeneous. Added glycerin stir until homogeneous. Next, add stearic acid stir until homogeneous. Added SLS stir until homogeneous. Add BHT, stir until homogeneous, add enough sakura oil, then add distilled water to 100 ml, then pack in the prepared container.

2.6 Evaluation Of Liquid Soap Preparations

2.6.1 Stability Test (Cycling Test)

The preparations were stored at 4º±2ºC for 24 hours, then transferred to an oven at 40ºC for 24 hours (one cycle). This test was carried out for six cycles, then observed the presence of phase separation, colour shape and odour.

2.6.2 Homogeneity Test

A certain amount of the preparation is smeared on transparent glass, then covered with a transparent material. The practice must show a homogeneous composition, and no coarse grains are visible. (Ditjen POM, 1985).

2.6.3 pH Test

Measurement of pH was carried out on liquid soap preparations that had been made before and after storage conditions. Measurement of pH is carried out with a pH meter by dipping the pH meter into the preparation. The pH value should ideally be the same as the pH of the skin or the site of application. This is to avoid irritation. The normal pH of human skin ranges from 4.5 to 6.5 (Draelos & Lauren, 2006).

2.6.4 Foam Height Test

Shake 1 ml of the sample with 50 ml of distilled water in a closed 250 ml measuring cup for 20 seconds regularly. Measure the height of the foam formed, then let it stand for 5 minutes, then measure the size of the foam again.

Calculation : Foam height (H) = Ho-Hs

Description: Ho= the height of the foam at first, Hs= the height of the foam after 5 minutes

2.6.5 Viscosity Test.

The instrument used to measure viscosity is the Brookfield viscometer. The soap is put into the container, then a spindle size four is attached to the viscometer, and the rotor is run at a speed of 30 rpm. (Wasiaturrahmah and Jannah, 2018).

2.6.6 Specific Weight Test

Clean the pycnometer using running water. Bake the pycnometer at 100ºC to dry. Insert the pycnometer into the desiccator. Weigh the pycnometer empty and record the weight, then pipet the liquid soap into the pycnometer slowly until it is full. Close the pycnometer again until the liquid soap comes out through the hole at the top of the pycnometer. Re-weigh the pycnometer containing the liquid soap and record the weight.

2.6.7 Irritation Testing of Volunteers

An irritation test was carried out on 12 volunteers to determine whether the preparations made could cause itching, redness and swelling and skin roughening. The method used in the open test is done by applying the practice two to three times a day in the test area, namely the skin behind the ear for two days (Wasitaatmadja, 1997). A positive irritation reaction is indicated by itching, redness and skin roughening in the test area.

2.6.8 Antibacterial Test

Tests were carried out on the preparation of Liquid Soap ethanol extract of the leaves of the wild Buas beast with the agar diffusion method using the disc diffusion method. Mueller Hinton Agar (MHA) media which has been sterilized, is inserted as much as 20 ml into a sterile petri dish. 0.1 ml of the bacterial suspension was pipetted and put into a cup, then levelled and allowed to solidify. Then the liquid soap preparations with various concentrations of 5%, 10%, 15% and 0% were taken and dipped in sterile disc paper into liquid soap and waited for 5 minutes to infuse. Then put the paper disc into a petri dish and let it sit for a while for the diffusion process. Then the cup was incubated for 24 hours at 37ºC. After incubation, calculate the diameter of the inhibition zone with a calliper. They performed three repetitions.

The test results concluded that based on the width of the diameter of the inhibition of bacterial growth, namely, the larger the area of inhibition of bacterial growth, the stronger the preparation as an antibacterial. 20 mm is categorized as moderate, and zones of 21-30 mm or more are classified as strong (Morales, et al, 2003).

III. RESULT

In this study, the extraction method used is the maceration method. This method was chosen because the process is easy, the equipment used is simple, and it does not damage the compounds contained in the test sample. The solvent used in this maceration process is ethanol. The choice of ethanol as a solvent is because ethanol can dissolve almost all secondary metabolites in the polar test sample. Extraction results obtained 58.75 grams of thick extract.

3.1 Phytochemical Screening Test

Phytochemical screening in this study was carried out on buas buas leaf ethanol extracts with the aim of knowing the class of secondary metabolites contained in buas buas leaf ethanol extract. The results of the phytochemical screening of Buas-buas leaf ethanol extract can be seen in the table below:

Table 2. Results of Examination of the Phytochemical Screening of Buas-buas leaf ethanol extract

No.	Group of Chemical Compounds	Identification
1.	Alkaloids	+
2.	Flavonoids	+
3.	Tannins	+
4.	Saponins	+
5.	Steroid/Triterpenoid	+

Description:

(+) = contains the substance being examined

(-) = does not contain the substance examined

Based on the results of the phytochemical screening examination above, it shows that Buas-buas leaf ethanol extract contains secondary metabolite chemical compounds, namely flavonoids, alkaloids, saponins, tannins and steroid /triterpenoid. On examination of alkaloid compounds, it was indicated by a blackish-brown residue on the addition of Bouchard at reagent and a reddish-brown precipitate on the acquisition of Dragendorff's reagent. Alkaloids have antibacterial activity with the mechanism of action of interfering with the peptidoglycan constituent components of bacterial cells. The cell wall layer is not fully formed and causes bacterial cell death. There is also a nitrogen-containing base group in the alkaloid compound that will react with the amino acid compounds that make up the bacterial cell wall. This reaction results in changes in the structure and composition of amino acids, which will cause a genetic imbalance in the DNA chain so that it will be damaged and encourage bacterial lysis, which will cause cell death in bacteria (Arlofa, 2015).

On examination of the flavonoid group compounds, it was indicated by the presence of orange colour on the separating amyl alcohol layer, proving that the clove flower extract positively contained chemical compound flavonoids. Flavonoids are a group of phenolic compounds that tend to bind to proteins, thereby disrupting bacterial metabolic processes. In addition, flavonoids also function as antibacterial by forming complex compounds against extracellular proteins that disrupt the integrity of the bacterial cell membrane. Flavonoids have a chemical structure in the form of a beta ring and -OH group, which are thought to be responsible for antibacterial activity. (Nugraha et al., 2017).Saponin compounds, the presence of saponin compounds is indicated by the height of the foam obtained from the clove flower extract, which is 2 cm, which proves that the minimum limit for saponin foam is 1 cm. Saponins have activity as an antibacterial with a working mechanism that causes leakage of proteins and enzymes from the cell. This can happen because the active substances found on the surface of saponins are similar to detergents; as a result, saponins will reduce the surface tension of the bacterial cell wall and damage the membrane permeability. Then the saponins diffuse through the outer membrane and cell wall, thereby disrupting and reducing the stability of the cell membrane. This causes leakage

and cytoplasm exit from the cell resulting in death in both gram-negative and gram-positive bacterial cells. (Suresh et al., 2013).In the tannin test, the clove flower extract was indicated by the presence of a blackish green colour with the addition of FeCl3 reagent, which means that the clove flower extract was positive for tannin compounds. Tannins have antibacterial activity with a mechanism of action, namely, interfering with cell permeability. This causes the cells to be unable to carry out life activities so that their growth is inhibited, and they die. Tannin compounds can induce the formation of tannin complexes to metal ions which can increase the toxicity of tannins. (Arlofa, 2015).

The steroid/triterpenoid test with the Liberman-Bouchard reagent gave a green color result.

3.2 Evaluation of Liquid soap

3.2.1 Stability test (Cycling Test)

Table 3. Observation Data of Liquid Soap Stability Test

Observation	Formula	Before Cycling Test	After Cycling Test					
			Duration of observation (cyclus)					
			1	2	3	4	5	6
consistency	F0	t	t	t	T	t	t	t
	FI	t	t	t	T	t	t	t
	FII	t	t	t	T	t	t	t
	FIII	t	t	t	T	t	t	t
color	F0	cd	cd	cd	Cd	cd	cd	cd
	FI	dg	dg	dg	Dg	dg	dg	dg
	FII	deg	deg	deg	Deg	deg	deg	deg
	FIII	bg	bg	bg	Bg	bg	bg	bg
odor	F0	ds	ds	ds	Ds	ds	ds	ds
	FI	ds	ds	ds	Ds	ds	ds	ds
	FII	ds	ds	ds	Ds	ds	ds	ds
	FIII	ds	ds	ds	Ds	ds	ds	ds

Description:

F0 = Buas-buas leaf ethanol extract 0%
FI = Buas-buas leaf ethanol extract 5%
FII = Buas-buas leaf ethanol extract 10%
FIII = Buas-buas leaf ethanol extract 15%
t = thick
cd = cloudy white
dg = dark green
deg = deep green
bg = blackish green
ds = distinctive smell

Fig 2. Liquid soap preparation (F0, FI, FII, FIII)

The stability observations were carried out on changes in the preparation's shape, colour, and odour. Observations were made in a refrigerator at 40C for 24 hours and in an oven at 400C for 24 hours; this treatment was carried out for six cycles; The results obtained did not occur phase separation. The typical smell of soap paste. In Formula I, dark green, the characteristic odour is a combination of cherry blossoms and wild beasts; in Formula II, it is dark green, the smell is typical of a variety of cherry blossoms and fantastic beasts; in Formula III, it is blackish green the scent is familiar of a combination of cherry blossoms and buas buas fantastic.

3.2.2 Homogeneity

The results of the observations obtained from the homogeneity test before the cycling test and after the cycling test were classified as homogeneous because they did not contain coarse particles when observed on a transparent glass. The results of the soap homogeneity test can be seen in table 4.

Table 4. The results of the homogeneity test of liquid soap ethanol extract of bus buas leaves (*Premna pubescens* Blume)

Formula	Before *Cycling Tes*	Homogeneity					
		Duration of observation (Cyclus)					
		1	2	3	4	5	6
F0	h	h	h	h	h	h	h
FI	h	h	h	h	h	h	h
FII	h	h	h	h	h	h	h
FIII	h	h	h	h	h	h	h

3.2.3 pH

The test for determining the pH of the preparation is one of the requirements for the quality of liquid soap. This is because liquid soap is in direct contact with the skin and can cause skin irritation if the pH is not in accordance with the skin's pH. According to SNI [17], the pH for liquid soap is allowed between 8-11. Based on the tests conducted before and after the cycling test, it showed that all the liquid soap formulas produced met the criteria for liquid soap.

Table 5. Observation of pH of liquid soap ethanol extract of buas buas (*Premna pubescens* Blume) leaves.

Formula	Before Cycling Test	After Cycling Test					
		Duration of observation (Cyclus)					
		1	2	3	4	5	6
F0	10,0	10,0	10,0	10,1	10,0	10,0	10,1
FI	10,2	10,2	10,2	10,3	10,2	10,2	10,3
FII	10,2	10,2	10,2	10,2	10,2	10,3	10,3
FIII	10,3	10,3	10,2	10,3	10,2	10,3	10,3

3.2.6 Viscosity Evaluation

Viscosity evaluation was carried out using a Brookfield viscometer. Viscosity evaluation aims to observe the viscosity of the preparation.

Tests using a viscometer were measured at a speed of 30 rpm using spindle number 4.

Table 6. Observation of the viscosity of liquid soap preparations ethanol extract of buas-buas leaves (*Premna pubescens* Blume)

Viscosity (c poise)	Formula	Before *Cycling Tes*	After *Cycling Test*					
			Duration of observation (Cyclus)					
			1	2	3	4	5	6

	F0	1210	1210	1230	1232	1230	1232	1226
	FI	1220	1220	1250	1240	1250	1245	1260
	FII	1240	1242	1240	1240	1245	1250	1270
	FIII	1250	1240	1250	1254	1250	1270	1290

Viscosity testing is carried out to determine the thickness of preparation; the higher the viscosity obtained, the thicker the results obtained. According to SNI, the viscosity requirement of liquid soap is 400-4000 CPoies. From the results of the liquid soap obtained before and after the cycling test, it still meets the requirements of liquid soap.

3.2.7 Specific Weight Test

Specific gravity was checked using a 10 ml pycnometer. Based on the observations before and after the cycling test, it can be concluded that all liquid soap formulations meet the requirements set by the Indonesian National Standard, namely 1.01-1.10 gr/ml. The results of specific gravity can be seen in table 7.

Table 7. Observation results. Specific weight of liquid soap ethanol extract of buas-buas leaves (*Premna pubescens* Blume)

Observation	**Formula**	**Before *Cycling Test***	**After *Cycling Test***					
			Duration of observation (Cyclus)					
			1	2	3	4	5	6
specific gravity (g/ml)	F0	1,00	1,00	1,00	1,00	1,00	1,00	1,00
	FI	1,06	1,07	1,06	1,07	1,06	1,06	1,07
	FII	1,07	1,07	1,06	1,06	1,07	1,07	1,07
	FIII	1,08	1,07	1,07	1,08	1,08	1,08	1,08

Specific gravity is determined by the concentration of extracts in the preparation; the more concentration of extracts in liquid soap, the higher the specific gravity results obtained. The results obtained before the cycling test on Formula 0 are 1.00 g/ml, Formula I obtained is 1.06 g/ml, Formula II is obtained that is 1.07 g/ml, and in Formula III, obtained 1.08 g/ml. After the cycling test in Formula 0, the specific gravity was stable until the 6th cycle; in Formula I, II and III, the specific gravity decreased and increased because it was influenced by temperature.

3.2.8 Foam Height Test Results

It can be seen the results of the foam height test in Table 8.

Table 8. Observation results foam height of liquid soap ethanol extract of buas-buas leaves (*Premna pubescens* Blume)

Formula	**Ho**	**Hs**	**H**
F0	100 mm	50 mm	50 mm
FI	140 mm	90 mm	50 mm
FII	150 mm	80 mm	70 mm
FIII	180 mm	90 mm	90 mm

Foam is one of the important parameters in determining the quality of soap products. According to SNI, the foam height requirement for liquid soap is 13-220 mm. From the results of observations, the height of the foam base for liquid soap is 50 mm, liquid soap with a concentration of 5%, the foam height is 50 mm, liquid soap with a concentration of 10%, the foam height is 70 mm, and the concentration of 15% is 90 mm. From the results obtained, it still meets the requirements of liquid soap.

3.2.9 Irritation Testing of Volunteers

The results of the irritation test carried out on volunteers were carried out by applying liquid soap preparations behind the ears. You can see the results of the irritation test for volunteers in Table 9.

Table 9. Table of irritation test results of liquid soap ethanol extract of buas-buas leaves (*Premna pubescens* Blume) on volunteers

Observation	Formula	Volunteer											
		1	2	3	4	5	6	7	8	9	10	11	12
Reddish skin	F0	-	-	-	-	-	-	-	-	-	-	-	-
Itchy skin		-	-	-	-	-	-	-	-	-	-	-	-
Swollen/rough skin		-	-	-	-	-	-	-	-	-	-	-	-
Reddish skin	FI	-	-	-	-	-	-	-	-	-	-	-	-
Itchy skin		-	-	-	-	-	-	-	-	-	-	-	-
Swollen/rough skin		-	-	-	-	-	-	-	-	-	-	-	-
Reddish skin	FII	-	-	-	-	-	-	-	-	-	-	-	-
Itchy skin		-	-	-	-	-	-	-	-	-	-	-	-
Swollen/rough skin		-	-	-	-	-	-	-	-	-	-	-	-
Reddish skin	FIII	-	-	-	-	-	-	-	-	-	-	-	-
Itchy skin		-	-	-	-	-	-	-	-	-	-	-	-
Swollen/rough skin		-	-	-	-	-	-	-	-	-	-	-	-

Description :

(-) : no reaction

The results showed that the volunteers did not react to skin irritation, redness, itching, and swelling. From the results of the irritation test, it means that the liquid soap preparations made are safe to use.

3.2.10 Testing the Antibacterial Activity of Liquid Soap Preparations Ethanol Extract of Buas Buas Leaves (*Premna pubescens* Blume)

Antibacterial activity tests were carried out on liquid soap, blanks, and positive controls using the agar diffusion method against Staphylococcus aureus bacteria. The test results can be seen in Table 10.

Table 10. The results of testing the antibacterial activity of liquid soap ethanol extract of buas-buas leaves (*Premna pubescens* Blume).

No	Formula	Rate of inhibition zone diameter (mm)
1	F0	0
2	FI	14,2
3	FII	15,0
4	FIII	16,0
5	Positive control	20,0

Description:

Positive control : liquid soap “Dettol”

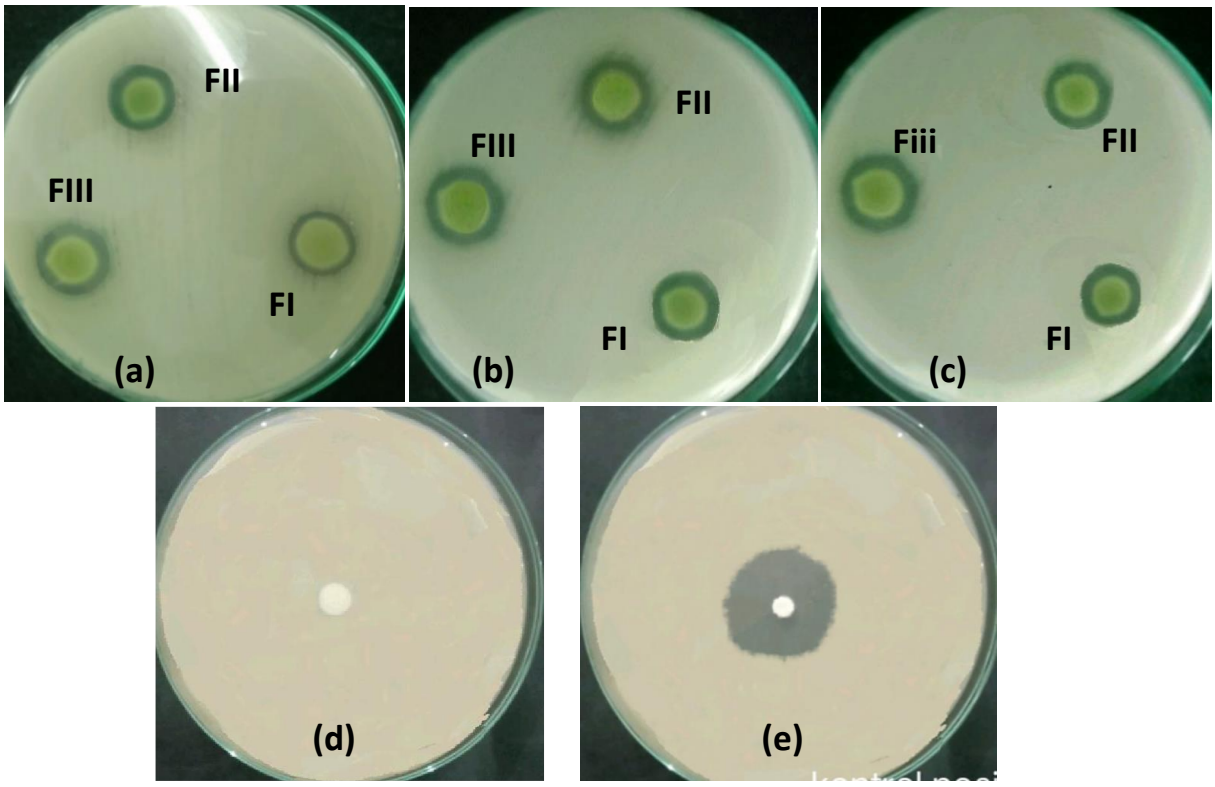

Fig 3.(a), (b), (c) Picture of Inhibitory zone diameter of buas buas (*Premna pubescens* Blume) leaf ethanol extract with three repitation. (d) control negative (F0), (e) control positive.

Previously, orientation with a concentration of 2.5% did not provide an inhibition zone. Therefore the concentration started from 5%. Based on the results obtained in the negative blank, there is no inhibition zone so that it does not provide an antibacterial effect, while the liquid soap concentration of FI is 14.2 mm, liquid soap with FII concentration is 15 mm, liquid soap with FIII concentration is 16 mm and in comparison, positive control (liquid Dettol soap) obtained the result of 20 mm. From the results above, it can be concluded that the inhibition zone obtained is categorized as moderate because it ranges from 11-20 mm. The mechanism of action of flavonoid antibacterials inhibits nucleic acid synthesis, inhibits cytoplasmic membrane function and inhibits energy metabolism of bacteria, the mechanism of action of tannins as an antibacterial is by inhibiting the enzyme reverse transcriptase and DNA topoisomerase so that bacterial cells cannot grow, the mechanism of action of saponins as an antibacterial is causing protein leakage. And enzymes from within the cell, the mechanism of alkaloids as an antibacterial is by interfering with the peptidoglycan constituent components in bacterial cells; the mechanism of steroids as an antibacterial is related to lipid membranes and sensitivity to steroid components that cause leakage in lysosomes. In the statistical test of the analysis of variation in the percentage of results using the SPSS method, a significance value of p = 000 (p <0.05) was obtained. This shows a significant result for each difference between concentrations. The Ducana test was carried out with p = 1,000 results; this indicates that it is not significant because it is more than (p < 0.05).

IV. CONCLUSION

The ethanol extract of buas buas (*Premna pubescens* Blume) leaves alkaloids, flavonoids, saponins, tannins and steroids/triterpenoids. Liquid soap ethanol extract of buas buas leaves with the formula 5%, 10% and 15% has a pH of 10-10.3; foam height 50-90 mm; viscosity 1210-1290 cP; specific gravity 1-1.08, did not cause irritation to volunteers and was stable during storage; and has inhibition zones of 14.2 mm, 15.0 mm, 16.0 mm, and 20.0 mm against Staphylococcus aureus bacteria with moderate activity category in inhibiting bacterial growth.

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