FORMULATION AND EFFECTIVENESS TEST OF ANTISEPTIC LIQUID HAND WASHING SOAP PREPARATION FROM TARO LEAF ETHANOL EXTRACT (Colocasia esculenta)

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ABSTRACT

The use of natural ingredients as active ingredients with antibacterial activity for making hand soap is still very little. The researcher is interested in conducting research on the formulation and effectiveness test of antiseptic liquid hand soap preparations from ethanol extract of taro leaves (Colocasia esculenta). The extraction process using 70% ethanol solvent at a ratio of 1:10 for 3x24 hours. Phytochemical screening tests were carried out by testing flavonoid compounds, alkaloids, saponins, tannins, and terpenoids. We prepared a Liquid Hand Washing Soap from Taro Leaf Extract (Colocasia esculenta) using a standard formula with three concentrations. Antiseptic Effectiveness Test of Liquid Hand Washing Soap. The method used is the zigzag method. The extraction results obtained were 21.10 grams or 14.06%. The results of the phytochemical screening test were only steroids that showed negative results. Preparation of liquid handwashing soap with concentrations of ethanol extract from taro leaves at 4%, 6%, and 78% can reduce the number of colonies by 30.9%, 51.9%, and 52.5%, respectively.

Keywords: *Colocasia esculenta, Taro leave, Formulation, Hand wash.*

INTRODUCTION

Antibacterials are compounds used to control the growth of harmful bacteria. Controlling the growth of microorganisms aims to prevent the spread of disease and infection, eradicate microorganisms in infected hosts, and prevent decay and destruction of materials by microorganisms (Salam et al., 2023). The mechanism of inhibition of bacterial growth by antibacterial compounds can be in the form of destroying cell walls by inhibiting their formation or changing them after they are formed, changing the permeability of the cytoplasmic membrane so that food materials are released from the cell, changing protein and nucleic acid molecules, inhibiting enzyme activity, and inhibiting the synthesis of nucleic acids and proteins (Yan et al., 2021).

The use of natural ingredients as active ingredients with antibacterial activity (inhibiting bacterial growth) and bactericidal (killing bacteria) for making hand soap is still very little (GERGES et al., 2021). One natural ingredient that has been proven to inhibit bacterial growth is taro leaves. There are many benefits from parts of the taro plant, but no one has conducted research on the leaves in the preparation of this liquid hand soap formulation. The results of the study showed that taro leaf extract contains flavonoids and saponins that can inhibit bacterial growth. Taro leaf extract is useful as an antibacterial against Escherichia coli and Bacillus cereus bacteria, with the best concentration of ethanol extracted from taro leaves being 50 mg/ml. The greater the concentration of the extract, the greater the inhibition zone formed (Shafwan et al., 2017). The researcher is interested in conducting research on the formulation and effectiveness test of antiseptic liquid hand soap preparations from ethanol extract of taro leaves (*Colocasia esculenta*).

METHODE

500 grams of taro leaf powder were extracted using the extraction method, namely maceration. We carried out the extraction process using 70% ethanol solvent at a ratio of 1:10 for 3x24 hours at room temperature. Phytochemical screening tests were carried out by testing

flavonoid compounds, alkaloids, saponins, tannins, and terpenoids.

Formulation of Liquid Hand Washing Soap Preparation from Taro Leaf Extract (*Colocasia esculenta*).

Table 1. Formulation of extract

Ingredient	Concentration (%) (gr)			
	F 0	**F1**	**F2**	**F3**
Extract	-	4	6	8
Sodium Lauril Sulfat	2	2	2	2
Carbopol	1	1	1	1
TEA	1	1	1	1
Gliserin	10	10	10	10
Propilenglikol	5	5	5	5
Methil Paraben	0,1	0,1	0,1	0,1
Fragrance (gtt)	q.s	q.s	q.s	q.s
Aquadest	Ad 80	Ad 80	Ad 80	Ad 80

Method of making liquid handwashing soap: namely, prepare all the ingredients to be used. We weigh the ingredients using the existing formula. Carbopol is dissolved in 25 ml of distilled water at a temperature of 80˚C in a mortar. We dissolve triethanolamine in water, add it to the carbopol mixture, and grind it until we form a homogeneous gel base. Next, add propylene glycol until a clear, expanding gel forms. Taro leaf extract is dissolved with glycerin, then added to the crushed gel mass. Next, sodium lauryl sulfate is added, which has been dissolved in hot water, stirred slowly, and the remaining distilled water is added up to 80 ml. Testing of the characteristics of the preparation includes organoleptic tests, pH, homogeneity, foam tests, and viscosity tests.

Antiseptic Effectiveness Test of Liquid Hand Washing Soap. The method used is the zigzag method. We wash our palms with running tap water for 60 seconds, then we dry them by shaking them for 75 seconds. After drying, we attach the thumbprints to the nutrient agar solid media in a petri dish until a zigzag line forms. The media will be incubated at 37ºC for 24 hours. After incubation, the number of colonies that grow is counted. After a few minutes, we wash the palms again with antiseptic liquid soap for 60 seconds before drying them. Furthermore, thumbprints are attached to the nutrient agar solid media in a petri dish. This media is incubated at 37ºC for 24 hours. After incubation, the number of colonies that grow is counted to see the difference.

RESULT AND DISCUSSION

The extraction yield was obtained at 21.10 grams or 14.06%. The phytochemical screening test results are as follows for the ethanol extract of taro leaves (*Colocasia esculenta*):

Table 2. The phytochemical screening test results.

No	Compound Groups	Result
1.	Alkaloids	+
2.	Flavonoids	+
3.	Tannins	+
4.	Saponins	+
5.	Triterpenoids/Steroids	-

According to the research, taro leaves (*Colocasia esculenta*) do contain chemicals like alkaloids, flavonoids, saponins, and tannins. Bacteria like *Escherichia coli* and *Staphylococcus aureus* can't grow when taro leaves (*Colocasia esculenta*) are soaked in ethanol. This ability shows that the ethanol extract of taro leaves has the potential to be made as an antiseptic liquid hand soap preparation in closing the entry path of bacteria into the digestive tract (Herwin et al., 2022).

This study focused on formulating liquid soap preparations using the ethanol extract of taro leaves. The manufacture of ethanol extract of taro leaves was carried out by maceration using 70% ethanol solvent. Soda with 70% ethanol was chosen because it can get rid of almost all of the semipolar to polar simplicia content (Tumiar Pakpahan, 2020).

Based on the results of organoleptic observations conducted for 4 weeks on the liquid hand soap preparation, there was no change, where the shape was thick and foamy, the color produced was clear white, and it had no aroma. When taro leaf extract was added at concentrations of 4%, 6%, and 8%, the preparation also did not change; the shape remained thick and foamy, the color was green, and the more concentrated the extract, the more concentrated the green color became, with a distinctive taro leaf odor.

The pH test aims to see whether the preparation made has the appropriate pH value and does not irritate the skin (Zahra et al., 2025). Based on the test carried out using a pH stick, namely on all formulas showing the same pH, shown on the first day, the pH produced was 5.5. Then on the 7th day, the pH measurement increased to 6.5, but on the 14th day, the 21st day, and the 28th day, respectively, in Table 5.4, it remained in the range of 5.5.

In the homogeneity examination of the liquid hand soap preparation, it was shown that all formulas were homogeneously dispersed because there were no coarse grains attached. The results of the foaming ability indicated that there was a difference in foaming power without extract and with taro leaf extract. Based on the results the foam height test had a value that varied from formula to formula. However, this measurement was in line with what the Indonesian National Standard expected. Based on the results obtained, it indicated that there was an increase in viscosity after 7 days of storage.

The antiseptic activity of this liquid hand soap is seen from the percentage of reduction, namely how much the soap can reduce the number of bacteria on the hands. Each group comprises two respondents, resulting in the collection of 10 data points. The negative control formula is used as a comparison to see whether the base of the liquid hand soap can reduce the number of bacteria or not and to avoid biased data. The base formula test can lower the number of bacteria by an average of 19.6%. This shouldn't have happened because the colony was already low, but it did because antiseptic was used before the negative control. The preparation of liquid hand soap containing 4%, 6%, and 8% taro leaf ethanol extract, along with a positive control, can reduce the number of colonies by 30.9%, 51.9%, 52.5%, and 51.4%, respectively.

Based on the results, it indicates that the greater the concentration of the extract given, the greater the % reduction in colonies produced. This is because taro leaf extract has a lot of alkaloid, flavonoid, tannin, and saponin compounds, which stop bacteria from growing very well.

The positive control is meant to serve as a standard for the formulation being studied. It is made from a brand of soap that contains antiseptic ingredients like chloroxylenol and salicylic acid. According to research by Dimpudus, brand-name soap has a strong 15-mm barrier that stops the growth of *Staphylococcus aureus* (Dimpudus et al., 2017).

KESIMPULAN

Preparation of liquid handwashing soap with concentrations of ethanol extract from taro leaves at 4%, 6%, and 78% can reduce the number of colonies by 30.9%, 51.9%, and 52.5%, respectively.

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