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FORMULATION OF ANTIBACTERIAL LIQUID SOAP EXTRACT LEAVES OF WILD PLANTS PECUT KUDA "*Starchytarpheta jamaicensis L.Vahl*" AS AN EFFORT TO IMPROVE HEALTH AND DIVERSIFY NATURAL INGREDIENTS

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ABSTRACT

At this time the use of soap increased. Based on data compiled by the Central Statistics Agency (BPS), in 2021, the proportion of households with laundry soap stations reached 80%. Washing hands with soap is useful so that hands become clean and can kill germs on the hands, and scientifically proven to prevent diarrheal diseases. Currently there are many soaps that offer various product advantages such as aroma, but unfortunately there are still rare soap products that offer antiseptic properties based on natural ingredients. The pecut kuda plant (Stachytharpheta jamaicensis L.Vahl) has potential as a natural anti-septic agent. This is evidenced by the research of Bekti and Kumala which states that horse sliced extract has an inhibitory power of 7 – 13, 67 mm for S. aureus bacteria and 7.67 – 14.67 mm for E. coli bacteria. Extraction of pecut kuda leaves using the dekocta method. The extract is then combined with ingredients such as CMC – Na, Glycerin, Propilenglikol and Sodium Lauryl Sulfate and mica/sparkling dye and then formulated into a liquid soap preparation. Then pH, viscosity, foam height, foaming power/foam retention, organoleptical tests and swab tests are carried out to ensure that the resulting products are suitable for use by the community. Based on the results of research that has been done, it is concluded that Pecut Kuda leaf extract can be formulated in the form of liquid soap preparations. At concentrations of 5%, 10%, and 15% already have antibacterial activity.

INTRODUCTION

At this time the use of soap increased. Based on data compiled by the Central Statistics Agency (BPS), in 2021, the proportion of households with laundry soap stations reached 80%. (BPS, 2021). One of the instruments of the handwashing policy is hand soap. Washing hands with soap is useful so that hands become clean and can kill germs on the hands, and is scientifically proven to prevent diarrheal diseases (Eni et al., 2020). Handwashing behavior with soap or known as CTPS is one of the public health practices that reflects clean and healthy living behavior (PHBS). The Coronavirus Disease (COVID-19) pandemic lasted for several years, causing adverse impacts on public health, but also had a positive impact on improving a person's PHBS behavior. It is proven by the significant increase in people's behavior in practicing CPTS during the pandemic to date compared to before the pandemic (Sultan &; Zikri, 2021).

CTPS habits cannot arise just like that, but must be familiarized from an early age. Children are agents of change to provide education both for themselves and their environment. Children are also considered quite effective in setting an example for older people, especially washing hands which have been considered unimportant (Natsir, 2018). One way that can be done so that children and adults like and get used to washing hands is to make interesting

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soap innovations by paying attention to the comfort factor in use, practical, and minimizing contamination from previous users. Liquid soap with mica / sparkling dye is a soap innovation so that it is expected to provide more choices to the public in order to choose soap that is considered good and attracts more children's attention, thus causing the habit of washing handsfrom an early age.

Pecut Kuda (Starchytarpheta jamaicensis) is a plant that is very much found in the bandungan area, Semarang Regency. The lack of public education and knowledge about the substances and properties of this plant makes horse sprint plants rarely processed or even only considered as weeds and wild plants that are eradicated by the community. Whereas on the other hand the use of natural potential can be an alternative to produce more economical products considering the availability of plants that tend to be still a lot and can be developed more easily and minimal side effects compared to chemicals. According to research conducted by Sintha Suherman in 2015 showed that horse sprint is one of the plants with various important compounds such as Flavonoids, Saponins, Tannins, Glycosides to Alkaloids (Suhirman, 2015).

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2.1 Materials

The materials used in this study include pecut kuda plant obtained at Bandungan, CMC-NA, Propilenglicol, Gliserin, Natrium Lauril Sulfat, Nipagin, Deodorizer, MicaDye, Aquadest.

2.2 Equipment

Equipment used in this study includes magnetic stirrers, glass beakers, mortars and stampers, ovens, grinders, filter paper, pH paper, measuring cups, stopwatches, and analytical balances, Rotatory Evaporator,math glass.

2.3 Sampel Preparation

The harvested part is the part of the leaves taken up to 3 rows below the leaf shoot. Ammentation should be done in the morning / evening to maintain the content of the sample. The harvested leaves of the pecut kuda then washed and wet sorting is carried out. And than After wet sorting, the leaves of the horse slicer are dried in the sun for approximately 24 hours. Then a simplisia of horse sliced leaves is formed which is determined to ensure that the simplisia used is a horse sprint (Starcytarpheta jamaicensis). After determination, horse cut leaf simplisia was extracted using the dekocta method at 900C within 30 minutes which was then filtered to separate the remaining simplisia pulp with the extract solution. The extract solution is evaporated using a Rotatory evaporator at 60^0C within 30 minutes until a viscous extract is formed.

2.4 Formulation Tablet Handsoap

Thick extracts were made 3 replications namely 5%,

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10% and 15%. The extract is formulated with the following formula:

Table 1. pecut kuda liquid soap Formulation

Meterial's	**F1 (%)**
Extract	5
CMC – NA	1,6
Propilenglicol	16
Gliserin	8
Natrium Lauril Sulfat	1.6
Nipagin	0.5
Deodorizer	qs
Mica Dye	qs
Aquadest	Ad 250 ml

2.5 Preparation of pecut kuda liquid soap

First of all several mixtures are made, the first mixture contains CMC-Na which is developed in 20 parts hot water then stirred until thickened which is called the first mixture. Followed by horse sliced extract mixed with propylenglycol, glycerin and a little water which is referred to as the second mixture. Nipagin is put into Erlenmeyer and dissolved with hot water called a mixture of 3 and Sodium Lauryl Sulfate (SLS) dissolved with boiled water 20 times and is the 4th mixture. After all mixtures are homogeneous, then mixture 1 is homogenized with mixture 2, mixtures 1 and 2 are homogenized with mixture 3 while mixture 4 is the mixture that enters last. Homogenize the entire mixture until a soap preparation is formed. Soap that has been formulated is carefully given with several physical tests including organoleptis, pH, foam height

/ foam retention, viscosity test and Swab test that we have previously modified.

2.6 Physical Evaluation of pecut kuda liquid soap

2.6.1 Organoleptic Test

An organoleptic test is a sensory evaluation method used to assess the physical and chemical properties of a substance based on the five human senses, such as taste, smell, texture, appearance, and color. (Maharani et al., 2021)

2.6.2 pH Test

pH testing using a paper pH tool is carried out by dipping pH paper in a soap tablet solution and repeated measurement 3 times. The pH of a good soap ranges from 4-6.

2.6.3 Foam Height Test

The foam height and stability test is a method used to evaluate the ability of foam to maintain its height and stability over time (Maharani *et al.*, 2021). A simple method is used to measure the height of the foam by inserting 1 g of ram preparation into a scaled tube containing 10 ml of aquadest and closed and shaken for 20 seconds to measure the height of the foam, after which it is allowed to stand for 5 minutes then measured again the height of the foam formed. Soapfoam by the Indonesian National Standard (SNI) is 12 - 220 mm.(Rinaldi et al., 2021)

2.6.4 Viscosity testing

Viscosity testing is carried out with a Brookfield viscometer with spindle number 3.

2.6.5 Testing the number of bacterial colonies

Testing the number of bacterial colonies was carried out to determine the presence or absence of bacteria taken on samples during hands before washing hands, washing hands only with running water, washing hands with liquid soap of Pecut Kuda leaf extract at each concentration at 5%, 10% and 15%, and washing hands with liquid soap brand X market.

RESULT AND DISCUSSION

Organoleptical observations are carried out to see the physical appearance of a preparation which includes shape, smell and color. The form of this liquid soap is liquid, viscous. This liquid soap has a wide range of smells and colors. The smell produced is the smell of wine, bubble gum, vanilla, orange, this smell is produced from the use of essence which aims to give a fragrant aroma to liquid soap. Dyes use mica/glitter dyes to produce more attractive colors. Based on the results of the research obtained, it shows that this organoleptical test is in accordance with the standards set by SNI.

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pH test is one of the quality requirements of sair soap because the soap will contact directly with the skin which can cause irritation if the pH does not match the pH of the skin. According to SNI, the pH of liquid soap is allowed between 8-11. Based on tests conducted from all three concentrations both at concentrations of 5%, 10% and 15% have a pH of 8.0. These results show that all liquid soap formulations meet the criteria for good liquid soap. Foam height testing is done to see how much foam is produced. Soap that produces excess foam will cause irritation to the skin. The required foam height is 13-220 mm.

From the results of observations made, at a concentration of 5% obtained results of 45 mm, 10% ; 49 mm, and 15% ; 60 mm. Soap foam is affected by several factors, including surfactants such as Sodium Lauryl Sulfate (SLS) and can be from the content of saponins in Horse Cut leaves. High foam liquid soap extract of Pecut Kuda leaves has met the standards set by SNI.

Viscosity testing is carried out with a Brookfield viscometer with spindle number 3 because the soap sample is liquid, viscous. The result obtained at a concentration of 5% is 2.215 cP ; 10% : 2.208 cP ; 15% : 2.021 cP.

This is because the higher the concentration of the extract, the lower the viscosity value. Viscosity testing is carried out with a Brookfield viscometer with spindle number 3 because the soap sample is liquid, viscous. The result obtained at a concentration of 5% is 2.215 cP ; 10% : 2.208 cP ; 15% : 2.021 cP. This is because the higher the concentration of the extract, the lower the viscosity value.

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We apply the data in the form of a table (Table 1.) as follows:

Table 1. Number of bacterial colonies on test Swab Sabun Pecut Kuda

No	Perlakuan	Jumlah Koloni
1	Dirty hand (Kontrol Negatif)	76 point
2	Hands Washed with Clean Water	67 point
3	Kontrol Positif	13 point
4	Pecut kuda liquid soap 5%	52 point
5	Pecut kuda liquid soap 10%	11 point
6	Pecut kuda liquid soap 15%	6 point

From these results we found data that horse sprint soap at 15% concentration has a level of bacterial inhibition so that it is effectively used as a hand washing medium**.**

CONCLUSION

Based on the results of research that has been done, it can be concluded that Pecut Kuda leaf extract can be formulated in the form of liquid soap preparations. At concentrations of 5%, 10%, and 15% already have antibacterial activity. The 15% concentration has the least number of colonies of the three concentrations performed.

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