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FORMULATION OF OINTMENT FROM METHANOL EXTRACTS OF SENGGANI LEAVES (*Melastoma malabathricum* L.) WITH VARIATION OF OINTMENT BASE

FORMULASI SALEP DARI EKSTRAK METANOL DAUN SENGGANI (*Melastoma malabathricum* L.) DENGAN VARIASI BAHAN BERBASIS SALEP

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Abstract

Senggani (*Melastoma malabatrichum* L.) is a traditional medicinal plant. The chemical content, including saponins, tannins, flavonoids, quinones, and steroids, in senggani leaves provides antibacterial effects. Ointment preparations are semi-solid preparations that are used for the outside of the body by applying to the outside of the body in the affected area. This study is experimental, aiming to determine the physical characteristics of ointments from the methanol extract of senggani leaves using a variety of ointment bases, namely hydrocarbon ointment base (F1), absoprsi (F2), water-washed (F3), and water-soluble (F4). Evaluation of ointment preparations in each formula includes Organoleptics, Homogeneity, pH, and Scatter. The results of the study of ointment preparations from formulas in the form of semi-solid odor typical of seggani and blackish green (F1, F2, F4) and light green (F3). Ointment preparations show homogeneous properties, with pH levels of 4.8 (F4), 5.0 (F3), and 6.1 (F2 and F1). The results showed that ointment preparations of methanol extract of senggani leaves that met the test requirements were only F2 and F3.

***Keywords*:** Ointment base, antibacterial, senggani leaf, *Melastoma malabathricum* L.

INTRODUCTION

Plants that can be used as traditional medicine are senggani (*Melastoma malabathricum* L.), which belongs to the family Melastomataceae. Senggani plants grow wild in areas that receive sufficient sunlight, such as on mountain slopes, in shrublands, fields that are not too arid, or in tourist attraction areas as ornamental plants. Senggani is efficacious as a fever reliever, pain reliever, for urination, relieving swelling, improving blood flow, treating edema, ulcers, and stopping bleeding. Parts commonly used from this plant include leaves, roots, seeds, and fruit (Dalimartha, 1999). Phytochemical screening results indicate that senggani leaf extract contains tannins, steroids, saponins, alkaloids, and quinones, which can be utilized as antibacterial agents (Auliafendri, 2023). Another component of senggani leaves, a flavonoid, can also inhibit bacterial growth (Maghfinaroh, 2015). In research conducted by Retnaningtyas and Mulyani (2008), the antimicrobial activity of the methanol extract fraction

of senggani leaves (*Melastoma candidum*) with concentrations of 20-100% exhibited antibacterial activity against Staphylococcus aureus, with an inhibition zone diameter of 17.44-23.99 mm.

Senggani is a shrub that grows 0.5-1.5 meters tall. Leaves are stalked, opposite, elongated or elongated ovate with a pointed tip, bony leaves 3.2-20 by 1-8 cm, both sides hairy. Flowers together 5-15, at the tips and axils of the highest leaves. Calyx tube bell-shaped, scaly taju with several small teeth. Guard leaf scaly, slender, not covering the bud. Corolla leaves are inverted ovate, 2-3 cm long, and the fruit is purple. Senggani is efficacious for digestive tract disorders, dysentery, bacilli, diarrhea, hepatitis, vaginal discharge, and mouth ulcers. Other benefits of senggani are also used to overcome excessive menstrual blood, uterine bleeding outside of menstrual time, nosebleeds, bleeding hemorrhoids, inflammation of the intestinal wall, blood vessels with blood clots in the channel, breast milk that is not smooth, cassava poisoning, drunk liquor, edema, scabies, and boils (Liana, 2015).

Figure 1. Senggani plants (*Melastoma malabathricum* L.)

Based on the antibacterial activity of senggani leaves, it is necessary to develop a pharmaceutical preparation that facilitates their use. Pharmaceutical preparations that can be made to facilitate their use include ointments, as they are one of the semi-solid preparations with a consistency suitable for treating skin diseases caused by bacteria (Naibaho *et al*., 2013). Ointments consist of medicinal ingredients that are dissolved or dispersed in an ointment base as a carrier of active substances. The ointment base used in a drug formulation must be inert, meaning it does not damage or reduce the therapeutic effect of the drug (Syamsuni, 2013). The use of one ointment base with another base has different properties due to the composition of different ingredients; therefore, the choice of base is critical because it affects the release of the drug (Voigt, 1995). This study aims to formulate an ointment preparation from the methanol extract of senggani leaves, testing the physical properties of the ointment at a concentration of 20%.

RESEARCH METHODS

Materials

The materials used in this study were senggani leaves, vaseline album, mineral oil, adipane, steryl alcohol, cera alba, vaseline album, sodium lauryl, paraffin liquid, propylene glycol, aqua dest, PEG 4000, and PEG 400.

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Procedure

This research is an experimental study conducted through laboratory tests to formulate an ointment containing a methanol extract of Senggani leaves (*Melastoma malabathricum* L.). The ointment to be made is 35 g with a concentration of 7 g (20%) ethanol extract of senggani leaves (Naibaho *et al*., 2013).

a. Hydrocarbon Base:

Ethanol extract of Senggani leaves	7 g
Vaselin album	31,5 g
Paraffin liquid	3,5 g

b. Absorpsi Base:

Senggani leaves	7 g
Vaselin album	30,1 g
Setyl alcohol	1,05 g
Cera alba	2,8 g

c. Water-washed Base:

Ethanol extract of Senggani leaves	7 g
Setyl alcohol	8,75 g
Natrium lauryl sulfate	0,35 g
Propylenglycol	4,2 g
Aquadest	12,95 g

d. Water-soluble Base:

Senggani leaves	7 g
PEG 4000	14 g
PEG 400	21 g

Simplisia Processing

Plucked and then collected senggani leaves that are not too young and not too old in green with 3-4 nodes from the shoots and branches/branches, wet sorting is carried out, then chopped to facilitate the drying process, dried senggani leaves until dry, then dry sorting is carried out to separate foreign objects and other impurities that are still there and left behind, then mashed senggani leaf simplisia that has been dried (Liana, 2015).

Extraction Process

Weighed 300 g of powdered simplisia into a maceration vessel, added 3000 mL of methanol, and covered it with aluminum foil. The mixture was stirred occasionally for the first 6 hours. Then let stand for 18 hours. After that, disserkai simplisia was simplified with a flannel cloth, then the maserat was separated from the sediment. The process was repeated twice. Then the maserat is evaporated with a rotary vacuum until a thick extract of senggani leaves is obtained (Kemenkes RI, 2010).

Ointment Procedure

1. Hydrocarbon base ointment

Vaseline album and paraffin liquid are put in a porcelain cup lined with gauze, then melted in a water bath. Then, it was blessed and placed into a mortar, where it was crushed until it became homogeneous, and then cooled. The methanol extract of senggani leaves was added incrementally while being crushed, until a homogeneous and semi-solid mass was formed (Arif, 2016).

2. Absorption base ointment

Vaseline album, adipose lane, cera alba put into a porcelain cup, then melted in a water bath. Then, please place it in a mortar and crush until it is homogeneous and cold. Added cetyl alcohol and stirred again until all ingredients are homogeneously mixed. The methanol extract of senggani leaves was added incrementally while the leaves were being crushed, until a homogeneous and semi-solid mass was formed (Sari *et al*., 2016).

3. Water-washed base ointment

Sodium lauryl sulfate, propylene glycol, and water were placed in a porcelain cup and then melted in a water bath. Put vaseline, album, and cetyl alcohol into a porcelain cup and melt in a water bath. Then put it into a mortar and crush it until homogeneous and cold. The methanol extract of senggani leaves was added to it gradually while being crushed, until a homogeneous and semi-solid mass formed (Sari *et al*., 2016).

4. Water-soluble base ointment

PEG 4000 and PEG 400 were put in a porcelain cup and then melted in a water bath. Put the mixture into a mortar and crush until it is homogeneous and cold. The methanol extract of senggani leaves was added incrementally while being crushed until it became homogeneous and formed a semi-solid (Sari *et al*., 2016).

Evaluations of Ointment

1. Organoleptical test

The ointment preparation will be observed organoleptically to determine a good ointment preparation, including observation of the shape, color, and smell of the ointment preparation made (Sari *et al*., 2016).

2. Homogeneity test

Homogeneity testing will be carried out using a sample smeared on a piece of glass or other suitable transparent material that must show a homogeneous arrangement (Syamsuni, 2013).

3. pH test

Measuring the pH value using a pH meter stick that is dipped into 0.5 g of ointment that has been diluted with 5 mL of distilled water. A suitable pH value is 4.5-6.5, which corresponds to the pH of human skin (Sari *et al*., 2016).

4. Scatterability test

Scatterability testing is performed by placing 0.5 g of ointment between two transparent object plates that are subjected to a 100 g load. Measurement of the diameter of the inhibition is done after the ointment does not spread again, or approximately 1 minute after giving the load. The diameter of good ointment spreadability ranges from 5 to 7 cm (Sari *et al*., 2016).

RESULT AND DISCUSSION

The results of extracting the senggani leaves' simplisia powder were obtained by soaking 300 g of the powder in methanol, using 3000 mL. After evaporation using a rotary vacuum, a concentrated extract of 49 g was obtained, corresponding to a percent yield of

16.33%. The extract had a typical senggani leaves smell and a blackish-green color. The results of testing the physical properties of senggani leaves methanol extract ointments, comparing the effects of hydrocarbon ointment base, absorption ointment base, water wash ointment base, and water-soluble ointment base, with a concentration of 20%, include organoleptic testing, homogeneity, pH, and spreadability. Organoleptical tests on ointments are observed by the naked eye to determine how the consistency, color, and smell of the ointments. The methanol extract formula of senggani leaves (*Melastoma malabathricum* L.) with absorption ointment base (F2), water-washed ointment base (F3), and water-soluble ointment base (F4) produced homogeneous ointment results. In contrast, the hydrocarbon ointment base (F1) produced an inhomogeneous ointment.

The consistency of the ointment preparation owned by the hydrocarbon ointment base formula is not homogeneous, this is because contain liquid paraffin (Naibaho, 2013), which can reduce the viscosity of the ointment mass so that a less viscous consistency is produced, while for the ointment formulation the water-soluble ointment base does not contain fatty ingredients which causes the consistency of the ointment produced to be relatively stiffer than which uses three other types of bases. Ointments with a hydrocarbon base and absorption base are blackish-green, while water-washed ointments are light green. Water-soluble ointments are yellowish-green; the yellow color in the water-soluble base ointment is likely influenced by PEG 4000. According to the description in the Indonesian Pharmacopeia III Edition (1979), PEG 4000 is a white or ivory-yellow, slippery powder.

The homogeneity test shown in Table 2 gives homogeneous results for absorption, water-washed, water-soluble ointment bases. The homogeneous ointment base indicates that the mixing of the ingredients used is good, so that there are no lumps or coarse grains in the formula. An ointment must be homogeneous and flat so as not to cause irritation and evenly distributed when used. Meanwhile, the hydrocarbon ointment base is not homogeneous because the base used contains oil and has a high concentration, making it challenging to homogenize.

The results of pH testing for hydrocarbon base, absorption base, water-washed base, and water-soluble formulations, as measured using a pH meter, are presented in Table 3 for hydrocarbon, absorption, water-washed, and water-soluble ointment base formulations that meet the test requirements. pH testing is performed to determine the nature of the ointment that is irritating to the skin. In each preparation of senggani leaf extract ointment base, different pH values are obtained for each ointment. pH exchange is carried out using a pH meter. Senggani leaves extract ointment with a variety of base types has a pH that matches the pH criteria of human skin, namely 4.5-6.5. Hence, it is safe to use, as a pH that is too acidic can irritate the skin, while a pH that is too alkaline can cause the skin to become scaly (Sari *et al.*, 2016). pH testing is performed to determine the nature of the ointment that is irritating to the skin.

The spreadability test for each preparation with various types of bases is carried out to see the ability of the preparation to spread on the skin, where an ointment base should have good spreadability or not and determine the softness of the ointment mass so that it can be seen the ease of applying the preparation to the skin (Naibaho *et al.*, 2013). The results of the

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spreadability test, presented in Table 4, show that the water-soluble and hydrocarbon base ointment formulas have a lower average value than the absorption and water-washed base formulas. The average value of the spreadability of absorption and water-washed base ointment formulations meets the requirements; the required value of the spreadability of topical ointment is 5-7 cm (Sari *et al.*, 2016). The difference in spreadability between hydrocarbon, absorption, and water-washed ointment base formulations is greater than that of water-soluble base ointments. States that the denser or thicker the ointment mass, the greater the viscosity, the smaller the spreadability (Naibaho *et al*., 2013).

Table 1. Results of Organoleptical Test of Ointment

Observation	Hydrocarbon Base (F1)	Absorption Base (F2)	Water-Washed Base (F3)	Water-Soluble Base (4)
Shape	Semisolid	Semisolid	Semisolid	Semisolid
Smell	Typical of Senggani	Typical of Senggani	Typical of Senggani	Typical of Senggani
Color	Blackish green	Blackish green	Light green	Blackish green

Table 2. Results of the Homogeneity Test of the Ointment

Formula	Results
F1	Not Homogeneous
F2	Homogeneous
F3	Homogeneous
F4	Homogeneous

Table 3. Results of pH Test of Ointment

Formula	Results
F1	6,1
F2	6,1
F3	5,0
F4	4,8

Table 4. Results of the Spreadability Test of Ointment

Formula	Results (cm)
F1	4,5
F2	5,5
F3	5,0
F4	4,25

Description:

F1: Hydrocarbon ointment base formula,
F2: Absorption ointment base formula,
F3: Water-washable ointment base formula, &
F4: Water-soluble ointment base formula.

CONCLUSIONS

The differences in the four types of ointment bases used in the formulation of senggani leaves extract ointment affect the physical properties of the produced ointment. The ointment formula has a different shape, color, pH, and spreadability depending on the type of base, but the smell of the resulting formulation remains the same. Absorption ointment bases are better than the other three bases.

REFERENCES

Anief, M. (2013). Medicinal Science, Gadjah Mada University Press, Yogyakarta.

Arif, M. Z. (2016). Ointment Formulation of Ethanol Extract of Krinyuh Leaf (*Eupatorium odoratum* L.).

Auliafendri, N., Gultom, R. P. J., Syari, D. M., & Samosir, S. R. (2023). Test The Activity Of A Mouthwash Preparation From The Extract Of Senggani Leaf Ethanol (*Melastoma Malabatricum* L.) Against The Fungus Candida Albicans. Jurnal Kesehatan, Rekam Medis dan Farmasi (JUK-Medifa), 1(02), 75-82.

Depkes RI. (1995). Indonesian Pharmacopoeia IV Edition. Jakarta.

Dalimartha, S. (1999). Atlas of Indonesian Plants, Volume I, Jakarta.

Gunawan D, Mulyani, S. (2004). Natural Medicinal Science. Bogor: Penebaran swadaya.

Hasibuan, S. A. (2016). Comparison of Inhibitory Power of Jatropha curcas Leaf Extract (*Jatropha curcas* L.). And Eshericia coli In Vitro. Thesis, Medan; Faculty of Pharmacy, University of. North Sumatra

Hariaman, A. (2008). Medicinal Plants and Their Efficacy, Jakarta. Penebar swadaya

Kurnia, Nani et al. (2014). Atlas of South Sulawesi Plants, Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Negri Makassar. Makassar.

Kemenkes RI. (2010). Indonesian Herbal Pharmacopoeia, Jakarta.

Liana, I., Astirin, P.O., & Retraningtyas, E. (2015). Antimicrobial activity of a fraction from the methanolic extract of senggani (*Melastoma candidum*) leaves towards Staphylococcus aureus and Salmonella: Typhimurium and thin layer chromatography profile of the most active fraction. Jurnal Biofarmasi, Vol. 13, No. 2, pp. 66-77.

Magfinaroh, Fika. (2015). Activity Test of 70% Ethanol Extract of Senggani Leaves (*Melastoma malabathricum* L.) Against Bacterial Colony Inhibition in Beef. Samarinda

Naibaho, H.O., Yamlean, Y. V. P., Wiyono, W. (2013). Effect of Ointment Base on the Formulation of Ointment Preparations of Basil Leaf Extract (*Ocimum sanctum* L.) on the skin of the Rabbit's Back made by *Staphylococcus aureus* infection. Pharmacy Study Program, FMIPA UNSRAT. Manado.

Rita, N. (2017). Ointment Formulation of Pliek U Ethanol Extract as Antibacterial. Poltekkes Kemenkes Aceh, Aceh Besar.

Sari, et all. (2016). Formulation of Ointment of Ethanol Extract of Turmeric Rhizome (*Curcuma longa* Linn). Poltekkes Kemenkes Aceh, Aceh Besar

Syamsuni, H. A. (2006). Prescription Science. Jakarta; Medical Books, EGC.

Suryaningsih, E. A, Mulyani, S and Retraningtyas, E. 2008. Antibacterial Activity of Coumpound Active Components of Senggani Leaves (*Melastoma malabatricum* D.Don). Against *Bacillus Licheniformis*. Department of Biology, FMIPA Sebelas Maret University.