



Plagiarism Checker X Originality Report

Similarity Found: 15%

Date: Saturday, February 19, 2022

Statistics: 259 words Plagiarized / 1674 Total words

Remarks: Low Plagiarism Detected - Your Document needs Optional Improvement.

ANTIBACTERIAL ACTIVITY TEST OF ACNE CREAM **BAWANG DAYAK (ELEUTHERINE BULBOSA (MILL.) URB)** AGAINST STAPHYLOCOCCUS AUREUS ABSTRACT Acne vulgaris is not dangerous disease but it can lead depression, acne is type of skin disease caused by bacteria. One of the causes of acne is Staphylococcus aureus. **Based on research before,** extract ethanol of bawang dayak from Central Kalimantan can inhibit S.aureus, so in this research ethanolic extract was made in cream formulation **to improve the efficiency of** using traditional medicine.

The **aims of this present study were to formulate anti** acne cream consist **ethanolic extract of bawang dayak and** evaluate antibacterial **activity of cream on** day-0 and day-7 to see stability activity and preparation. The Methods of this study are **cream formula of Bawang Dayak** divided into 4 formulas with different concentration of ethanolic extract bawang dayak then was evaluated organoleptic characteristics, homogeneity, pH, adhesion test, dispersion test and in vitro antibacterial test against S.aureus with diffusion method. The results show the homogeneity **of the cream shows** F3 dan F4 separate and non homogen on day-7 but all formula pH suitable for topical application.

Antibacterial activity of antiacne cream bawang dayak was indicated from zone of inhibition, on day- 0 F1 = 11.50 ± 0.14 mm (weak activity), F2= 17.20 ± 0.85 mm (moderate activity), F3= 16.90 ± 0.28 mm (moderate activity) and F4= 17.45 ± 2.90 mm (moderate activity) while on day-7 respectively F1= 10.25 ± 0.21 mm (weak activity), F2= 11.40 ± 0.28 mm (weak activity), F3= 13.35 ± 0.35 mm (moderate activity) and F4= 15.75 ± 1.20 mm (moderate activity), on day-7 zone of inhibition **of all cream formula** decrease but still can inhibit. So it can be concluded that all Cream Formula potential against S. aureus but this study must be improved both of preparation and stability activity.

Key words: Acne vulgaris, Bawang dayak, Cream, Eleutherine bulbosa, Staphylococcus aureus

INTRODUCTION Nowadays people choose natural remedies for traditional cosmetics. Cosmetics are products which are used to purify and beautify the skin. The best reason for using traditional cosmetics because natural content in the herbs does not have any side effects in the human body (Mishra et al., 2014). Cosmetic products need to be effective and stable but also the acceptance by the consumer needs to be confirmed because the incorporation of natural extracts could confer undesirable characteristics, strong colors or aromas (Soto et al., 2018).

Running title Empirically, Bawang dayak is known to have efficacy for treating skin diseases. One type of skin disease caused by bacteria is acne. Acne, a chronic inflammatory disease of the pilosebaceous units of the face, neck, chest and back, is the most common skin disorder occurring universally, with an estimated prevalence of 70-87%. It is a pleomorphic disorder characterized by both non-inflammatory (comedones) and inflammatory (papules, pustules, nodules) lesions (Kaymak and Onder, 2008).

Bawang dayak contain chemical compounds like alkaloid, flavonoid, tanin, saponin and naphthoquinones which potential as antibacterial (Ardhany, 2019; Novaryatiin et al., 2019; Rani, 2018; Ravichandiran et al., 2019). Based on research Novaryatiin et al., 2019 ethanolic extract of bawang dayak (Eleutherine bulbosa (Mill.) Urb) positively can inhibit Staphylococcus aureus, so in this study ethanolic extract of bawang dayak was made in formula cream as a product of traditional cosmetic.

MATERIAL AND METHODS Material Bawang dayak (Eleutherine bulbosa (Mill.) Urb) were procured from farmer cultivation in Sei Gohong, Bukit Batu Palangka Raya, Central Kalimantan and identified at Indonesian Institute of Sciences Research Center For Biology.

The part used is bulb of bawang dayak. **Extraction** The plant materials were washed with water and dried under the sun for 5-7 days. The dried plant materials were crushed by grinder. Then, the powder was extracted with 96% ethanol by using percolator and all extracts were evaporated by using rotary evaporator to reach a viscous extracts.

Phytochemicals Screening The prepared cream of ethanolic extract of bawang dayak was subjected to phytochemical screening to detect the presence/ absence of secondary metabolites (Kaur and Prasad, 2016).

Formulation Preparation The components of formulation were listed in Table 1. The components consist of oil soluble (stearic acid, adeps lanae, paraffin liquid) and water soluble (TEA, nipagin dan aquadest). Each solution oil soluble and water soluble heated up to 55°C until melts. Ethanolic extract of bawang dayak dissolved in aquadest, then

put into water phase and stir until homogen in mortar, oil phase add gradually, then stir until the cream base is formed. The last add oleum roses and stir ad homogen.

The cream was evaluated on day-0 and day-7 without any special treatment. Evaluation Test of Cream a. Organoleptic Properties The cream was observed for color, odor and appearance b. Homogeneity Observed The particles size was observed on the slide to find the coarse particles. Preparations should show a homogeneous composition and no visible coarse particles (Nazliniwaty et al., 2016) c. pH Measurements Determining pH of the preparation is done by using pH meter (El-Gied et al., 2015) d. Dispersion Test Cream with 0.5 g was placed in the middle of a round glass scale.

Round glass which has been weighted placed there on and left for 5 minutes. After that followed with 50 g load, let stand for 1 minute and record the diameter of the spread cream, did the same thing with 100 g and 150 g (Safitri et al., 2016) e. Adhesion Test A total of 0.5 g of preparation was spread on the disc glass, on top of it other glass object placed and pinned under 1 kg load for 1 minute. Then disc glass mounted on test equipment, load is released and the time was recorded up to the second object of the glasses falling off (Safitri et al.,

2016) Evaluation of antibacterial activity by zone of inhibition by well diffusion method Cream of ethanolic extract of Bawang Dayak were evaluated for in vitro antibacterial activity against acne vulgaris were caused by Staphylococcus aureus using the disc diffusion method with different concentrations of extract in cream formula. The bacterial isolates were subcultured into a nutrient the 24-hour-old bacterial culture was standardized using McFarland standard (106 cfu/mL of 0.5 Mcfarland standard). Mueller Hinton Agar (MHA) was used for bacteria bioassay. MHA was prepared by dissolving 38g in 1000 ml of distilled water and brought to boil to completely dissolve. Sterilization was achieved by autoclaving at 121°C for 15 minutes (Mhatre et al., 2014).

MHA plates were prepared and bacterial strains were inoculated by cotton swab and then antibiotic and cream with various concentration of extract bawang dayak applied in it. The plates were incubated at 37° C for 24 hours and the zone of inhibition was measured (Bhalodia and Shukla, 2011) and recorded later on. RESULT AND DISCUSSION A. Evaluation test of cream formula The results of organoleptic test on day-0 showed that F1 had a lighter brown color than other formulas, it caused the concentration of ethanolic extract bawang dayak less concentration than other formulas (Fig 1.).

Day-7 all formulations became darker than before, it was probably due to ethanolic extract of bawang dayak content antioxidant compound. The odor of F3 dan F4 on day-0 have sharper odor than F1 and F2 it caused concentration of ethanolic extract, but

the odor has no change on the day- 7. The types of all cream formula are oil in water (o/w). The observation of cream bawang dayak on day-0 all formulation homogen, but on day-7 F3 and F4 showed separation phase between the oil phase and the water phase (Table 2.).

The pH observation showed all cream formula of bawang dayak Running title around 6 on day-0 and day-7 (Table 3). The pH that suitable for topical application is between 4.5-6 same with pH of skin (Mali et al., 2015). The dispersion test adding and without adding weight has an average for more than 3 cm to all cream formula both on day-0 and day-7 (Table 4). Adhesion test of cream on day-0 was more than 4 second and time of adhesion decrease on day-7 (Table 5). B. Antibacterial activity Based on research before ethanolic extract of Bawang dayak can inhibit Staphylococcus aureus (Novaryatiin et al., 2019) as well as bawang dayak in cream in this study.

The antibacterial activities can be classified into three levels: weak activity (< 12 mm), moderate activity (12-20 mm) and strong activity (> 20 mm) (Shahbazi, 2017). The inhibitory test results of control positive (clindamycin) shown on Table VI (Fig 2.), the antibacterial activity test of cream ethanolic extract bawang dayak on day-0 F1 have 11.50 mm inhibition zone (weak activity), F2 = 17.20 mm (moderate activity), F3 = 16.90 mm (moderate activity) and F4 = 17.45 mm (moderate activity), while all of the formulas that lasted for 7 days have decline of zone inhibition value but F3 and F4 still in same category, moderate activity (Table VII.)

(Fig 3.). Inhibition zone decrease on day-7 may be caused not placed in special storage area such as a cold area in the refrigerator, so it was needed develop further study. Inhibition of all formulas againts Staphylococcus aureus because ethanolic extract of bawang dayak contain secondary metabolites like alkaloid, flavonoid, tanin and saponin. Many studies have suggested that flavonoid act in plants as antioxidant and antimicrobial, flavanoid is the largest group of phenol compounds that effectively inhibit the growth of viruses, bacteria and fungi (Harlita et al., 2018; Panche et al., 2016).

The presence of alkaloid, saponin and tannin may serve as potential compounds that can act as antibacterial against bacteria acne causing like Staphylococcus aureus (Khan et al., 2018; Mabhiza et al., 2016; Min et al., 2008). Some of these bioactive compounds that are synthesized as secondary metabolites as the plant grows are also used to protect the plant against microbial attacks (Razmavar et al., 2014). CONCLUSION All cream formula of ethanolic extract bawang dayak potential inhibit Staphylococcus aureus, but on day-7 value of zone inhibition decrease.

This study must be developed such as cream formula, improve effectiveness and

combination with another material, so as the formula not separate and the effectivity is stable.

INTERNET SOURCES:

<1% - <https://www.researchgate.net/profile/Susi-Novaryatiin-2>

<1% -

https://www.philadelphia.edu.jo/academics/s_telfah/uploads/method%20of%20extraction.pdf

2% -

https://www.researchgate.net/publication/316618811_Formulation_and_Evaluation_of_Multipurpose_Herbal_Cream

1% -

https://www.researchgate.net/publication/275052715_Investigation_of_cream_and_ointment_on_antimicrobial_activity_of_Mangifera_indica_extract

<1% -

https://www.researchgate.net/publication/329037096_FORMULATION_AND_EVALUATION_OF_MOISTURIZING_CREAM_CONTAINING_SUNFLOWER_WAX

<1% - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7120914/>

2% - <https://www.mdpi.com/2079-9284/5/1/13/htm>

2% - <https://europepmc.org/article/MED/15556732>

1% - <https://www.researchgate.net/profile/Syahrida-Dian-Ardhany>

<1% -

https://www.researchgate.net/publication/352372994_The_Anti-inflammatory_Effect_of_Ethanol_Extract_Gel_of_Fig_Leaves_Ficus_carica_Linn_and_Sidr_Leaves_Ziziphus_mauritiana_Linn

1% -

<https://www.japtr.org/article.asp?issn=2231-4040;year=2021;volume=12;issue=1;spage=94;epage=98;aulast=Ardhany?type=3>

3% -

<https://www.scholarsresearchlibrary.com/articles/antibacterial-activity-of-leaf-extract-of-cassia-alata-separated-by-soxhletextraction-method.pdf>

<1% -

https://www.jurnal.ugm.ac.id/TradMedJ/oai?metadataPrefix=oai_dc&from=2018-06-20&verb=ListRecords

1% - <https://www.sciencedirect.com/science/article/pii/S0360544218311836>

2% -

https://www.researchgate.net/profile/Rajendran-Ramasamy-4/publication/341766752_Preliminary_phytochemical_screening_green_synthesis_of_silver_nanoparticles_and_antibacterial_activity_using_leaf_extraction_of_Indigofera_linifolia/links/5ed2a48c45851529451d

00be/Preliminary-phytochemical-screening-green-synthesis-of-silver-nanoparticles-and-antibacterial-activity-using-leaf-extraction-of-Indigofera-linifolia.pdf