



Research Article

## Formulation And Physical Properties Evaluation Of Beach Morning Glory (*Ipomoea Pescaprae*) Leaves Ointment

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### ABSTRACT

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**Background:** *Ipomoea pescaprae* is one of the plants used as traditional medicine which is widely used as a topical medicine, one of which is to treat jellyfish stings and ulcers. This study aims to determine how to formulate ointment preparations from *Ipomoea pescaprae* extract and to test the physical properties of *Ipomoea pescaprae* preparations. **Methods:** *Ipomoea pescaprae* leaves were extracted using the maceration method using methanol as a solvent and then made preparations in the form of an ointment using concentration variations, namely (F1) - , (F2) 1 % , (F3), 3 % (F4), 5 % (F5) 10 %. Furthermore, the physical stability test of the ointment was carried out, namely the Cycling Test including organoleptic test, homogeneity test, pH test and spreadability. **Results:** The results obtained that *Ipomoea pescaprae* extract ointment has a fairly good stability based on the stability test of the third formula, which is the most stable preparation.

### 1. Introduction

Indonesia is a country that has various types of medicinal plants, one of which is beach morning glory. Beach morning glory is a tropical vine that is easy to find and belongs to the Convolvulaceae family. Coastal communities use beach morning glory leaves as first aid medicine for jellyfish stings (Wardhani & Poedjirahajoe, 2020). Beach morning glory plants or also known as katang-katang are reported to contain alkaloids, flavonoids, triterpenoids, saponins, steroids, cardiac glycoside, tannins, anthocyanins and phenols (Nilam et al., 2018).

People in Indonesia have taken advantage of the beach morning glory plant as a traditional treatment, its use is applied by applying it through the skin to treat inflammation of the skin, such as acne and boils (Andayani et al., 2018). One form of medicinal preparations to treat skin diseases is ointment preparations.

Ointment is a semisolid preparation that is soft, easy to apply, and is used as an external drug on the skin and mucous membranes. The release of medicinal ingredients from the ointment base is strongly influenced by physico-chemical factors both from the base and from the medicinal ingredients, solubility, viscosity, particle size, homogeneity, and formulation (Hernani MY et al., 2012). Based on research conducted by Muthalib (2013), it was stated that ointment containing ethanol extract from Beach morning glory leaves was effective in healing open wounds on rabbit.

Beach morning glory currently has not found any research related to the formulation in the form of an ointment that will be used as a boil medicine. From the above background, researchers are interested in formulating beach morning glory into ointment preparations and evaluating the physical stability of the preparation because no research has been found regarding this matter, especially the Beach morning glory which grows in the coastal area of Sekupang Beach.

## 2. Materials and Methods

### Materials

The materials used are beach morning glory, methanol (CH<sub>3</sub>OH), Hydrochloric Acid (HCl), Magnesium Powder (Mg), Mayer's Reagent, Acetic Acid (CH<sub>3</sub>COOH), Sulfuric acid (H<sub>2</sub>SO<sub>4</sub>), yellow Vaseline (Subur Kimia Jaya), Lanolin (Subur Kimia Jaya), Methyl paraben (Golden Era), Cera Alba (Subur Kimia Jaya), Tekaso1<sup>®</sup> (PT. Surya Dermato Medica Laboratories). The tools used are Glassware, analytical balance, rotary evaporator (heidolph), pH meter paper, viscometer (LV800), digital scale, mortar, evaporating dish, watch glass, water bath, beaker glass, plastic pot, stirring rod, funnel, spatula, parchment paper.

### Methods

#### Sampling

The sample used in this study was 10 kg of beach morning glory taken from the coastal area of the Riau Archipelago.

#### Sample Determination

Sample determination Beach morning glory (*Ipomoea pes-caprae*) conducted at the Andalas Herbarium, Andalas University, Padang.

#### Preparation of Beach morning glory (*Ipomoea pes-caprae*) Extract

Beach morning glory which has been obtained as much as 10 kg is washed and air-dried in a room that is not exposed to sunlight for approximately 3 days. The dried beach morning glory was soaked in 70% methanol for 2 days. Then the yield was first filtered with Whatmann filter paper into an Erlenmeyer tube to obtain the filtrate. The filtrate is concentrated using a rotary evaporator until the solvent evaporates to obtain a thick extract (Akmal et al, 2015). Then the yield of the extract was calculated using the formula (Marselia et al., 2015).

$$\text{Yield of extract (\%)} = \frac{\text{mass of extract}}{\text{mass of simplicia}} \times 100\%$$

### Phytochemical TEST

#### Alkaloid Test

1 gram extract dissolved in ethanol. 2 ml of the solution was evaporated in a cup porcelain using a hotplate. Residue dissolved in 5 ml of 2N HCl. The solution obtained was divided into 3 reaction tubes. The first tube was added with 3 drops of HCl 2N, second tube added with 3 drops Dragendorff's reagent, while the third

reagent added with 3 drops of Mayer's reagent. The formation of a precipitate indicates that the sample contains alkaloids. Reaction with Dragendorff's reagent will be formed orange precipitate, with Mayer's reagent yellow is formed.

#### **Flavonoid Test**

As much as 1 mL of the sample was put into a test tube, then 2 drops of concentrated hydrochloric acid (HCl) were added and shaken vigorously. After that, magnesium powder (Mg) was added and shaken vigorously. The sample contains flavonoids if there is foam and the solution will experience a color change from the initial green color to red, yellow, orange (Mailuhu et al., 2017).

#### **Tannin Test**

1 ml of sample. Added a few drops of a solution (FeCl<sub>3</sub>) iron (III) Chloride 1%. The presence of tannins in the sample is indicated by the appearance of a dark blue or blackish green color (Yunus et al., 2018).

#### **Saponin Test**

1 mL of the sample put into a test tube and add hot water, then add a few drops of concentrated HCl. A positive test is indicated by the formation of permanent foam for 15 minutes (Illing et al., 2017).

#### **Terpenoid Test**

A total of 1 ml of the extract solution was added with Liebermann Burchard reagent (acetic acid and sulfuric acid). The positive test for terpenoids is orange or purple, steroids are blue (Tiling et al., 2017).

#### **Making Beach morning glory Ointment**

Making the ointment begins with weighing the required ingredients. Cera alba is melted on a water bath. Once melted, add yellow Vaseline and stir until homogeneous and cool. After that, add Lanolin and add Nipagin, stir homogeneously. After that it becomes a base, after it becomes a base, add the thick extract of beach morning glory into the base little by little while stirring until it is homogeneous with the desired concentration in the ointment (Moefiah et al., 2011).

#### **Evaluation of the formulation of the Beach morning glory Ointment**

The evaluation carried out was an examination of the stability of the ointment dosage form, examination of homogeneity, examination of color, and examination of odor, at weeks 1, 2, 3, 4. This test was carried out to determine the occurrence of physical changes in the five samples of ointment formula and ointment base, which stored for 4 weeks at different temperatures.

#### **Physical Properties Test of Preparations**

##### **1. Organoleptic**

Organoleptic examination includes the shape, color and odor of the ointment. Parameters of good quality ointment are semi-solid dosage forms, the ointment has a distinctive smell to the extract used and the color is like the extract (Anief M, 2013).

##### **2. Spreadability**

The dispersion test was carried out by placing 0.5 g of ointment between two transparent object plates which were given a load of 100 g. The spread diameter measurement was carried out after the ointment did not spread again or approximately 1 minute after the load was applied. The diameter of the spread of the good ointment is between 5-7 cm (Grag et al., 2002).

##### **3. Adhesion**

The adhesion test was carried out by placing an adequate amount of ointment between the two slides. Then given a load of 1 kg for 5 minutes. The two objects are separated by pulling the slide at the top with a weight of 80 g through a control, while the slide at the bottom is held in place by the load. The length of time it

takes to separate the two objects is recorded as sticking time. (Miranti, 2009). The conditions for a good ointment are if the longer the time it takes for the two glass objects to come off, the better the adhesion of the ointment. The longer the ointment is attached to the skin, the greater the effect (Voigt R, 1995).

#### **4. Homogeneity Test**

Homogeneity is carried out to see the mix of ingredients contained in the ointment preparation (homogeneous) so that when used it can seep and enter the skin without feeling any fine granules that interfere or cause discomfort during use. The ointment is in a homogeneous state which is characterized by the absence of particles or fine grains in the cross section of the slide (Depkes RI, 1979).

#### **5. pH test**

The pH test using a universal pH stick tool dipped in was carried out by weighing 0.5 g, the extract was diluted with 5 mL of distilled water. A good pH value is 4.5 -6.5 or in accordance with the pH of human skin (Tranggono R, Latifah F, 2007).

#### **6. Viscosity Test**

The preparation of 100 grams of ointment is put into a measuring cup and then measured using a Viscosity LV - 800 tool. Viscosity is seen on the scale in the tool after the stability of SNI 16 - 4399 - 1996 is reached, which is between 2000 - 50,000 Cps (Depkes RI., 1979).

#### **Data analysis**

The results of the ointment stability test were processed descriptively, and translated into tables and figures.

### **3. Results and Discussions**

#### **Sample Determination**

The results of the determination showed that the plant used was indeed the Beach morning glory (*Ipomoea pescaprae*). Plant determination was carried out at the Andalas Herbarium, Andalas University, Padang.

#### **Beach morning glory Extract Preparation**

10 kg of fresh samples of beach morning glory, dried and then obtained 6 kg of dried powder of beach morning glory, then macerated and obtained a thick extract of beach morning glory as much as 248 g. so that the percent yield is 15.5%.

#### **Phytochemical Test**

Phytochemical screening test is carried out to provide an overview of the class of compounds contained in the sample under study. Phytochemical screening test was carried out by testing color using a color reagent (Kristiani et al., 2008). The results of phytochemical screening showed positive results on secondary metabolites of alkaloids, flavonoids, phenolics, and negative results on secondary metabolites of saponins and steroids. This is in line with research according to (Marfuah et al., 2018) which showed positive results on secondary metabolites of alkaloids, flavonoids, phenolics and negative results on secondary metabolites of saponins and steroids.

#### **Evaluation of Ointment Preparations**

##### **Organoleptic Test**

The organoleptic test was carried out by looking at the color and smell of the ointment (Anief M, 2013). In terms of the ointment dosage form, all formulas are semisolid, with the color for the formula with the addition

of yellowish green F1 concentration, F2 slightly yellowish green, F3 slightly brownish green F4 slightly blackish green, the addition of different extracts makes the preparation the resulting ointment is also different. The higher the concentration of extract added to the ointment, the more concentrated the color of the resulting ointment.



**Figure 1.** a. F0 ; b. F1 ; c. F2; d. F3; e. F4

### **Homogeneity Test**

The homogeneity test was carried out to see the mixture of the ingredients contained in the ointment preparation (homogeneous) so that when used it could seep and enter the skin without feeling any fine grains that interfered with or caused a feeling of discomfort during use. The ointment preparation is in a homogeneous state which is characterized by the absence of particles or fine grains in the cross-section of the glass object (Depkes RI, 1979).

### **Spreadability Test**

The spreadability test is a test carried out to determine the ability to spread ointment preparations when applied to the skin, the greater the spreadability of the ointment means the wider the contact between the skin and the ointment so that the active substances contained in the ointment can be spread well and evenly. The results obtained indicate that the ointment made meets the requirements for good ointment spreadability at week 4 with an average Base of 5.8 cm, F1 6.5 cm, F2 6 cm, F3 5.9 cm, F4 5.9 cm, this value indicates that all the formulas made have met the specified requirements with values ranging from 5 - 7 cm (Grag, et al., 2002).

### **Sticky Data Test**

Adhesion test shows the tendency of a material to stick to other materials (Norman, 2007). This test is used to find out how long the time for the ointment to stick to the skin surface. The thicker or denser the concentration, the longer it takes to separate the two glass objects (Nugroho, 2008). So that if the concentration of the ointment is getting thicker, the contact of the drug on the skin surface will also be longer. The results obtained are that the ointment made meets the requirements for good adhesion, the ointment made meets the adhesion requirements at week 4 with an average Basis value of 12.65 seconds, F1 21.39 seconds, F2 07.68 seconds, F3 11.03 seconds, and F4 11.02 seconds.

### **pH test**

The pH test is carried out to see how the pH of the ointment preparation that has been made is in accordance with the pH/skin, not too acidic or too alkaline to avoid damage or problems caused to the skin. The results obtained in this test are that the base has a pH 5, F1 is pH 5, F2 is pH 5, F3 is pH 5, F4 is pH 5. This value indicates that all formulas made meet the pH requirements of the ointment preparations with a range ranging from 4,5 - 8.0 according to SNI 16 - 4399 - 1996.

#### Viscosity Test

Viscosity testing using a viscometer LV 800. Viscosity test is the resistance of a liquid to flow, the higher the viscosity the greater the resistance to flow. The requirement for viscosity value according to SNI 16 - 4399 - 1996 is between 2000 - 50,000 Cps (Fuuta, 2016). High viscosity will reduce the level of comfort of use because it is difficult to flow, so that when removing packaged preparations it also becomes difficult (Martin et al., 1993). The viscosity results obtained from the ointment base (F0) and beach morning glory extract ointment formulation (F1, F2, F3, F4) were F0 (22.500 Cps), F1 (25.000 Cps), F2 (30.500 Cps), F3 (32.000 Cps), and F4 (50.000 Cps). In this study, F3 had good viscosity and was as desired as a beach morning glory ointment compared to other formulas.

#### Evaluation Test

The evaluation test was also carried out to test the stability of the ointment which was divided into 3 series of tests, namely cycling test, mechanical test, and storage test at low temperature ( $4\pm 2^{\circ}\text{C}$ ). the possibility of crystallization to test the ointment preparation as an indicator in terms of the stability of the ointment preparation (Rieger, 2000). This test was carried out for 6 cycles to clarify the physical changes that occurred with each cycle calculated every 48 hours at two different temperatures every 24 hours, the results were that the entire formula did not change at all for 6 test cycles (stable), then the mechanical test.

#### 4. Conclusions

Based on the results of research the following results were obtained:

1. Beach morning glory extract (*Ipomoea pescaprae*) can be formulated into ointment preparations.
2. Beach morning glory extract ointment (*Ipomoea pescaprae*) has a fairly good stability based on the stability test of the third formula, which is the most stable preparation.

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