



Formulation and Stability Test of Anti-Acne Toner Preparation with Jasmine Flower Extract (*Jasminum sambac L*)

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ABSTRACT

Toner can prevent residue and sebum from absorbing into the pores of the face which can cause various problems on the skin of the face such as acne. Jasmine flowers have a content that can inhibit *Staphylococcus epidermidis* bacteria and *shigella flexneri* bacteria with a concentration of 10% which is one of the bacteria that can cause acne. The purpose of this study was to analyze the effect of variations in surfactant concentration on the stability of anti-acne toner preparations with jasmine flower extract and to identify the optimal formulation based on the results of the evaluation of anti-acne toner preparations with jasmine flower extract. The laboratory experimental research method used a quasi-experimental method without a control group with a one-group posttest only design. Jasmine flower extract was formulated as many as 2 formulas with variations in polysorbate 20 concentration of 5% and 5.65%, then a stability test was carried out using the cycling test method for 12 days for 6 cycles by evaluating before and after the stability test, including organoleptic, homogeneity, viscosity, and pH. The results of the study showed that the preparation of jasmine flower extract toner (*Jasminum sambac L*) with variations in surfactant concentration showed differences in organoleptic, homogeneity, pH, and viscosity. In the pH test it was unstable ($p < 0.000$). The viscosity test of formula I ($p < 0.081$) was stable, formula II ($p < 0.400$). The conclusion of the two formulas in making jasmine flower extract toner preparations with variations in surfactant concentration from the results of all cycles in the cycling test obtained physically stable evaluation results but were chemically unstable so that there was no optimal formula.

Keywords: *jasmine flower extract; toner formulation; surfactant*

1. INTRODUCTION

Acne is a skin problem in the form of infection and inflammation of the polysebaceous unit according to Karim (2017). Acne often makes you restless and often loses your self-confidence, especially if the acne area is very large. Acne usually occurs in children to adolescents. Occurs on the back, shoulders, face and chest. The occurrence of men and women is almost the same but is more common and the severity is in men during adolescence Karami et al. (2023).

The aim of this study was to analyze the effect of variations in surfactant concentration on the stability of anti-acne toner preparations with jasmine flower extract and to identify the optimal formulation based on the evaluation results of anti-acne toner preparations with jasmine flower extract. There are several factors that cause acne, one of which is bacteria. Causes of acne other than bacteria include genetic factors, hormones, seasons, stress, food, sebaceous gland activity, bacterial infections, cosmetics, and other chemicals Karami et al. (2023).

Jasmine flowers or often known as jasmine flowers are plants that have the scientific name *Jasminum sambac L*. which have a distinctive fragrant aroma that is often processed into perfumes or beauty products. The content of phytochemical screening carried out on jasmine flowers (*Jasminum sambac L*.) contains eugenol, linaloon, β caryophyllene, or α -bisabolenes and other active compounds in jasmine flowers, Karami et al. (2023).

According to Hikmah et al. (2023), jasmine flowers have a content that can inhibit *Staphylococcus epidermidis* bacteria and *shigella flexneri* bacteria with a concentration of 10% which is one of the bacteria that can cause acne. The use of synthetic drugs is usually often used in facial toners, but the side effects caused by synthetic drugs cause serious skin problems such as acne.

One of the skincare preparations that has the main function as a facial cleanser and also as a moisturizer is toner. Facial toner can clean make-up residue, other dirt and remove sebum that is left or stuck to the skin because



it is difficult to clean with regular facial wash, thus the use of toner can prevent residue and sebum from absorbing into the pores of the face which can cause various problems on the skin such as acne Christanti (2018). Based on the problems that occur on the skin, the product that is made as a solution to this skin problem is a facial toner product made from natural ingredients.

Toner formulations usually use a water base while other additional ingredients include active substances, humectants, emollients, surfactants, preservatives. One of the things that affects the quality, stability, and can increase the solubility of facial toner preparations is surfactants (Noor at al., 2023). Surfactants are one of the compounds used in cleaning products that have broad functions and can function as solubilizers and stabilizers agents. Surfactants that are often used as solubilizers and stabilizers agents are polysorbate 20.

Polysorbate 20 has the advantages of being non-toxic and non-irritating, so it is very suitable for use as a cosmetic additive (Fauziah, 2023). Based on research of Alvinari (2021) on the manufacture and stability testing of facial toner preparations using polysorbate 20 surfactants with concentrations of 5% and 5.65%, stable preparations were obtained. Based on the description above, the researcher wants to formulate an anti-acne toner preparation with jasmine flower extract as a variation in the concentration of polysorbate 20 surfactant and conduct a stability test of the formulated toner preparation, so that an optimal anti-acne toner preparation with jasmine flower extract is obtained, an optimal and stable anti-acne toner with jasmine flower extract Riswanto et al. (2023).

2. METHODS

The research method used was a laboratory experiment using a quasi-experimental method without a control group using a one-group posttest only design. This method does not have a control group and the sample is not selected randomly, thus producing clear causal conclusions by reducing the inclusion of alternative explanations to see the effect of the treatment that has been given (Slamet et al., 2020). This study compares variations in the concentration of polysorbate 20 surfactants on the evaluation before and after the stability test of the jasmine flower extract anti-acne toner preparation. The data collection instrument used in this study used an experimental test in the laboratory by conducting observations and documentation. Observations are carried out by observing events to obtain information or descriptions to answer the formulation of research problems. Documentation comes from the word document which means a record of past events, can be in the form of writing or pictures to obtain data or information related to the problem being studied Mahulauw & Takamokan (2024).

The tools used in this study included glassware (Pyrex), analytical scales (Shimadzu Corporation ATX 224) to measure the time required by a certain amount of fluid to flow through a capillary tube with the force caused by the weight of the solution itself, pH meter (Lutron) to measure the pH (degree of acidity or alkalinity) of a liquid, and refrigerator (from Sharp brand).

The materials used in this study were: jasmine flower extract, polysorbate 20 (Pharmaceutical Grade), glycerin (Pharmaceutical Grade), butyl hydroxytoluene (Cosmetic Grade), phenoxyethanol (Cosmetic Grade), buffer solution 5.5, ethanol (Technical Grade), aquadest (Technical Grade).

3. RESULTS & DISCUSSION

3.1 Jasmine Flower Extract

Jasmine flower extract was made by maceration method with 96% ethanol solvent, but because the ethanol material is limited it is replaced with distilled water. Jasmine flowers were dried in a place that was not exposed to direct sunlight until the water content in the flowers decreased. The dried jasmine flowers were then ground using a blender then sieved until smooth. Next, the jasmine flowers was weighed and dissolved with distilled water for 3x24 hours until the extract was thickened in a water bath.



Table 1. Jasmine Flower Extract Process

	Jasmine flower refining process
	Heating jasmine flowers with a mixture of distilled water, until dissolved and produces jasmine flower extract
	Jasmine flower extract filtering process
	Material mixing process
	Product results

3.2 Organoleptic Test

Organoleptic testing was carried out to see the physical appearance of the facial toner preparation by observing using human senses on the shape or texture, color, and odor of the preparation that had been made (Hayati et al., 2019) the formula produces the same shape or texture, color, and odor, namely liquid form, clear brown color, and has a distinctive jasmine odor.



Figure 1. Organoleptic Test Results



3.3 Homogeneous Test

Homogeneity testing is carried out by visually observing the particles in a preparation to see whether the particles are mixed homogeneously or not homogeneously. The test is carried out by taking the toner preparation, then putting it in a glass beaker and then observing the arrangement of coarse particles in the toner preparation.

3.4 pH Test

In this pH test, we got a pH result with a pH value of 5, which means that pH 5 is suitable for facial skin



Figure 2. pH Test Results

4. CONCLUSION

Based on the results, it can be concluded that the statistical results show that variations in surfactant concentration have an effect on physical and chemical stability. From the two formulas in the manufacture of jasmine flower extract toner preparations with variations in surfactant concentration from the results of all cycles in the cycling test, the evaluation results were physically stable in organoleptic, homogeneity, and viscosity tests, but were not chemically stable in the pH test so that it can be concluded that there is no optimal formula in this study.

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