

FORMULATION AND CHARACTERISZATION OF JUICE OF LIME GEL USING CMC-NA BASE

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INTRODUCTION

Lime (*Citrus aurantifolia*) is a plant that is efficacious and commonly used by the people. It is used for juice, dessert, pickle, medicinal purpose and cosmetic. In the field of beauty lime is used to whiten the skin, obesity and cellulite and has an astringent and toning action to clear oily skin and acne [1,2].

The content of lime is very much, such as carbohydrate, sugar, protein, minerals (Ca, Fe, Mg, P, K, Na, Zn), vitamins (ascorbic acid, thiamin, riboflavin, niacin, vitamin B6, folate, vitamin B12, vitamin A, vitamin E) [3] and volatile oil that most important flavoring oils, lemon essential oil are complex mixtures of chemical compounds like limonene, γ -terpinene, citral, alool and β -caryophyllene [4]. The organic acid component of acid lime juice is primarily composed of citric acid [5]. Ascorbic acid and citric acid have antioxidant activity and one of the activities of antioxidant is to prevent premature aging [6], so the lime can be used as a sunscreen.

This study was to determine of physical and chemical characteristics of the juice of lime gel formulation with dosage levels of 10%, 20% and 30% in the CMC-Na base.

MATERIAL AND METHODS

The research material used is lime (*Citrus aurantifolia*) was obtained from Malang and was identified by Materia Medica Technical Service Unit.

PREPARATION GEL JUICE OF LIME

The composition of the gel lime juice with dosage levels of 10%, 20% and 30% seen in Table 1.

Material name	Quantity		
	F I	F II	F III
Juice of lime	20.0 g	40.0 g	60.0 g
CMC-Na	8.0 g	8.0 g	8.0 g
Propylene glycol	30.0 g	30.0 g	30.0 g
Nipagin	0.5 g	0.5 g	0.5 g
Aqua distilled ad	200.0 g	200 g	200 g

Table 15. The composition of the gel formulation of lime juice.

Method of preparation gel juice of lime as follows: Making gel of juicy lime begins by dispersing CMC-Na in aqua CO₂-free to make a gelling base. Juice of lime mixed into the gelling base, then nipagin dissolved in propylene glycol, which is then appended to the gelling base that contained the juice of lime slowly and mixed until homogeneous. Last added aqua distilled until the desired weight and stirred until homogeneous.

EVALUATION PREPARATION

Characterization of the gel formulation of lime juice

Characterization of the gel formulation of lime juice includes organoleptic, viscosity and pH.

Organoleptic examination

Organoleptic examination of the gel formulation of lime juice includes texture, color, and odor

Measurement of the viscosity

Measurement of the viscosity of the gel of lime juice using a cup and bob Viscometer (Visco Rion tester vT-04F).



Measurement of pH gel of lime juice
Measurement of pH gel of lime juice done by 20 + Basic pH meter.

Determination of the release of citric acid from lime juice gel formulation

Diffusion cells, which had been prepared, put into the glass beaker at test release tools contained CO₂-free distilled water. The experiments were performed at room temperature (27°C ± 0,5°C). Paddle rotated every 10 minutes, 10.0 ml of footage taken at minute 0, 60, 120, 180, 240 and 300, subsequently it's absorption observed with UV-Vis spectrophotometer at a wavelength of 512 NM. To account for the dilution of 10.0 ml of the release medium, the measured levels corrected with Wurster equation.

Determination of acceptability of lime juice gel preparation.

The test is performed using a 10 woman aged 19-24 years old with no distinguishable types of skin. Respondents using gel juice of lime on the forearm and then asked his opinion about the ease of smeared, sensation while in use and easy to clean.

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RESULTS AND DISCUSSION From the results of the observation appears that the organoleptic of lime juice at a dosage level of 10%, 20% and 30% has a dense and creamy texture, but it possesses a different color and odor, the lime juice gel at a dosage of 10% is clear and odorless, the dosage of 20% is slightly yellowed and a bit smelly, whereas dosage of 30% is yellow with lemon smell sharper. Its suggest that elevated dosage of lime juice will increase the intensity of the color gel preparation and sharpen the lemon smell. For the viscosity of lime juice gel preparations at a dosage of 10 %, 20% are similar, and at dosage of 30% the viscosity of gel of lime juice is increasing (Table 2).

Formula	organoleptic	viscosity	pH
F I	clear, odorless	50.000cPs	4.64±0.50
F II	slightly yellowed, bit smelly	50.000cPs	4.39±0.15
F III	yellow, lemon smell sharper	60.000cPs	3.77±0.09

Table 2. Characteristic of lime juice gels at dosage of 10% (F I), 20% (F II) and 30% (F III) of lime juice.

Measurement of pH on the lime juice gel at a dosage of 10% and 20% are similar, where use the gel of lime juice at a dosage of 30% is higher than the other formula (Anova, α=0.05). This is caused by the pH of lime juice is 2.33, so that the addition of lime juice will lower the pH of the gel preparation (Table 2).

Based on the data obtained from the release of citric acid from lime juice gel preparation, calculated the area under the curve (AUC) to determine the release rate of citric acid from the gel of lime juice (*Citrus aurantifolia*). The result of AUC calculation can be seen in Figure 1.

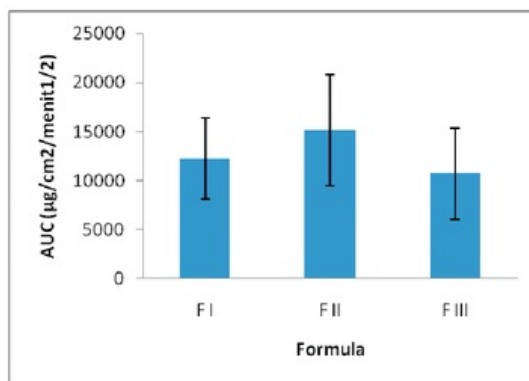


Figure 1: Histogram of AUC of citric acid release from the lime juice gel preparation at dosage of 10% (F I), 20% (F II) and 30% (F III) of lime juice.



It is showed that the AUC of the three formulas are not significantly different (Anova, $\alpha=0.05$). It can be concluded that elevated concentration of lime juice on the formula of this gel formulation does not increase the value of AUC on a test release of citric acid from lime juice gel preparation. These may be caused by the interaction between active ingredient with material and viscosity of preparation.

From the results of the test acceptability of gel lime juice preparation is known that the formula contained 30% of lime juice has a high percentage of ease smeared (softness) and cold sensation. For ease of cleared, gel content of 20% of lime juice has a higher percentage, this is due to its has lower viscosity than gels lime juice content of 30%, so that the formula of gel contained of 30% lime juice is the most acceptable (Table 3).

Formula	Parameters of acceptability (%)		
	Ease smeared	Cold sensation	Easy to clean
F I	66.70	70.00	63.33
F II	70.00	73.33	76.70
F III	73.33	83.33	66.47

Table 3. The results of acceptability test of lime juice gel content of lime fruit at dosage of 10% (F1), 20% (F II) and 30% (F III).

CONCLUSION

The results obtained in this study showed that the differences in the levels of the juice of lime (10%, 20% and 30%) on lime juice gel formula with CMC-Na base produces a characteristic and acceptability are different, but the results of the test release of citric acid from lemon juice gel is similar. Base in characteristic physical (organoleptic, pH and viscosity), acceptability and effectiveness of the lime juice gel formulations, the formula that content of 20% of lime juice is the best.

REFERENCES

1. P. P. Joy, J. Thomas, Samuel Mathew, Baby P. Skaria. (1998). Medicinal Plants. Aromatic and Medicinal Plants Research Station. pg:189.
2. C. P. Khare. (2007). Indian Medicinal Plants: An Illustrated Dictionary. Springer publication. pg:153-157.
3. United States Department of Agriculture. (2014). National Nutrient Data base for Standard Reference Release 27. Basic Report 09160, Lime juice, raw.
4. Benvenuti F, Gironi F, Lamberti L. (2001). Supercritical detpenation of lemon essential oil, experimental data and simulation of the semicontinuous extraction process. J of Supercritical Fluids, May;20(1):29-44.
5. R. K. Soost and J. W. Cameron. (1961). Fruit Characters in Young Trees of Long-Established Nucellar Lines. Proc. 2nd Conf. Intern. Org. Citrus Virol.: 8-14.
6. Murray JC, Burch JA, Streilein RD, et al.(2008). A topical antioxidant solution containing vitamins C and E stabilized by ferulic acid provides protection for human skin against damage caused by ultraviolet irradiation. J Am Acad Dermatol, Sep; 59(3):481-25.

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