

# A Stick Formulation of a Mixture of Citronella Oil, Cananga Oil and Patchouli Oil as Aromatherapy

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**Abstract**-Human are expected to be competent especially in industrial development. The effect of this demand is stress. However, stress can be reduce by using essential oil of aromateraphymade from mixture of citronella oil (oleum citronella), cananga oil (oleumcananga), patchouli oil (oleum patchouli). Those mixture are formulated into aromateraphy stick. The subject of this study was to formulatedaromateraphy stick from mixture of citronella oil (oleum citronella), cananga oil (oleumcananga), patchouli oil (oleum patchouli) and was to investigate the physical stability test. The design of this research was experimental study. Sodium lauryl sulphate was formulated into 1%, 1,5% and 2% as emulgator and the mixture of oils as active agent was formulated into 3% and 6%. The result of this study showed that after 28 days storage in room temperature. The pH was tended to increase, the melting point was decrease, all aromateraphy stick could spread on the skin well, were homogenous, no change colour, odor and with no irritation skin. It maybe conclusion that themixture of citronella oil (oleum citronella), cananga oil (oleumcananga), patchouli oil (oleum patchouli) could be into aromateraphy with good physical stability. In addition, the most optimal formula of aromateraphy stick was formula III containing sodium lauryl sulphate 2% and active agent 3%.

**Keywords:** *aromateraphy, stick, sodium lauryl sulphate, citronella oil, cananga oil, patchouli oil.*

## I. INTRODUCTION

Humans are currently demanded to be more competitive due to industrial progress, population growth, rapid economic growth and various kinds of life problems. This big demand makes people feel depressed, not relaxed and experiencing health problems such as insomnia, lack of concentration, fatigue and stress. from the results of her research on stress, it was found that as many as 13.3% of people experience stress. Some ways that can be done to reduce stress include maintaining a healthy and nutritious eating pattern, maintaining physical fitness, breathing exercises, relaxation exercises using aromamatherapy [1].

Aromatherapy is a method of treating essential oils through odor media that has been used for thousands of years. Some essential oil source plants that grow in Indonesia include fragrant roots, ylang, turmeric, patchouli leaves, cloves, citronella, citronella, betel, eucalyptus, gandapura, kaffir lime, kenikir, key, basil, celery and basil According to [2] who has examined the effectiveness of a mixture of cananga oil, patchouli oil and citronella oil is better than lavender oil in dealing with stress. Essential oils can be used as aromatherapy after being diluted with a carrier oil or formulated into other preparations. Various kinds of

aromatherapy preparations that are on the market, including creams, roll on, rubbing oil, soap and body cream. However, many people have difficulty using these dosage forms, resulting in non-compliance with the use of drugs and ineffective therapies. Innovation is needed in developing new preparations by formulating appropriate dosages to improve patient safety and compliance. Appropriate preparations are sticks [3] emollients, stiffening agents, humectants, and emulsifiers. The emulgator functions as a unifier of the oil phase and the water phase. In this preparation, the emulgator is one of the factors that affects the physical stability of the preparation because the active substance used is essential oil from various plants. Common emulsifiers are anionic groups, for example sodium lauryl sulfate [4]. Sodium lauryl sulfate used as an emulgator will produce preparations with good color but has the disadvantage of being able to irritate the skin [5] In theory, the use of sodium lauryl sulfate in the concentration range of 0.5% - 2.5% is not expected to cause skin irritation [6].

Determination of the exact concentration of sodium lauryl sulfate is needed to produce a stick preparation that is safe for human skin on medicated sticks by using sodium lauryl sulfate as an emulgator and given the efficacy of a mixture of citronella oil, cananga oil, and patchouli oil for relaxation in Richard's research (2013), the researchers are interested in conducting research with the title oil mixture lemongrass (*Oleum Citronella*), cananga oil (*Oleum Cananga*), and patchouli oil (*Oleum Patchouli*) in an aromatherapy stick formulation with variations of sodium lauryl sulfate as an emulgator. The Purpose is formulating an aromatherapy stickmixture of fragrant lemongrass oil (*Oleum Citronella*), cananga oil (*Oleum Cananga*), and patchouli oil (*Oleum Patchouli*) with variations of sodium lauryl sulfate which are stable and meet the requirements.

**II. METHOD**

The method used in this study was experimental by making several formulations of aromatherapy sticks containing a mixture of fragrant lemongrass oil (*Oleum Citronella*), cananga oil (*Oleum Cananga*), and patchouli oil (*Oleum Patchouli*).

*1. Tools and Materials*

The tools used in this study include porcelain cups, measuring cups, beaker glass, stirring rods, analytical

scales, dropper pipettes, spatula, ph sticks, melting benches, glass objects, and waterbaths. Materials used in this research include a mixture of citronella oil,

cananga oil, and patchouli oil, cera alba, cetyl alcohol, propylenglycol, Na lauryl sulfate, vaselin album, and aquadest.

*2. Oil Identification*

*a. Organoleptic*

Citronella oil is a clear liquid, yellow to pale yellow, sweet-scented. Patchouli oil is a clear yellow liquid, with a distinctive odor. Cananga oil is a clear, pale yellow or yellow liquid, sweet smelling, fresh and sharp.

*b. Refractive index*

The refractive index of a substance is the ratio of the speed of light in a vacuum to the speed of light in that substance. The refractive index of oil can be determined using the Abbe Refractometer, according to the Ministry of Health (1995) citronella oil has a refractive index of 1.4660 - 1.4730, patchouli oil has a refractive index of 1.4916 - 1.5220 and ylang oil has a refractive index of 1, 4774 - 1,5078. The refractive index is measured in the following

$$BJ = \frac{c - a}{b - a}$$

way :

Drop 2-3 drops of distilled oil onto the prism surface, then cover Look through the binoculars, rotate the scale dial until the dark-light boundary in the field of view is coincided with a diagonal line intersection drops of the oil to be identified. Perform the same procedure as calibration.

*c. Density*

Density of a substance is the weight in g per ml of liquid at 20°C. Weight per ml of patchouli oil is 0.9724 to 1.0028. Weight per ml of cananga oil is 0.8982 to 0.9286. Weight per ml is measured using a pycnometer by weighing an empty pycnometer (for example: a gram), fill the pycnometer with water to the full, cover and rinse then weigh (eg: b gram), dry the pycnometer, then fill it with oil to the full, then weigh it (e.g. c grm). Weight per ml is calculated by means of BJ x0.99718g.

3. Formulation of Aromatherapy Stick

NO	Material	Control Formula	Jumlah yang digunakan						Info
			Formula I	Formula I I	Formula III	Formula IV	Formula V	Formula VI	
1	Mixture of Citronella Oil, Cananga Oil and Patchouli Oil ( 1: 3: 3)	-	3%	3%	3%	6%	6%	6%	Active substance
2	Cera Alba	21%	21%	21%	21%	21%	21%	21%	Stiffening agent
3	Cetyl alcohol	17,5%	17,5%	17,5%	17,5%	17,5%	17,5%	17,5%	Stiffening agent
4	Vaselin alba	15%	15%	15%	15%	15%	15%	15%	Emollient
5	Na. Lauril sulfat	1%	1%	1,5%	2%	1%	1,5%	2%	Emulgator
6	Propilen glikol	13%	13 %	13%	13%	13%	13%	13%	Humektan
7	Aquades	Ad 15	Ad 15	Ad 15	Ad 15	Ad 15	Ad 15	Ad 15	Substance bearer

1) Procedure

- Put cera alba, cetyl alcohol and vaseline album into the cup (oil phase) (mass 1)
- Enter the sodium laurel sulfate, propylene glycol and Aquadest into the cup (water phase) (mass 2)
- Heat the oil phase and water phase to a temperature of 70° C
- Add the oil phase slowly added to the aqueous phase, stirring constantly until homogeneous (mass 3)
- Add the mixture of oil of patchouli, ylang oil and lemongrass oil little by little into the mass 3 at a temperature of 55 ° C stirring constantly until homogeneous.
- The mass pour into the mold in hot conditions, then cool.

a. Physical Stability Test

Physical stability test performed, among others, the pH, the melting temperature, dan organoleptik preparations (color and odor) after storage for 28 days, on days 0, 7, 14, 21, and 28.

pH

The pH value of the preparation can be measured using a pH meter. To measure this pH value, a sample of 1 gram is needed which is melted in a glass beaker with 100 ml of Aquadest on a water bath

Melting Temperature

Melting temperature of the preparation can be measured using the Kofler Heating tool, after the device has been turned on for 1 hour, the aromatherapy stick sample is placed on the heating plate, observe the changes that occur and see what temperature the aromatherapy stick melts.

Homogeneity Test

Homogeneity test is done by applying an aromatherapy stick on a transparent glass (glass object) and seeing whether there are coarse grains left in the glass [7].

Lubricant

The topical test was carried out involving 30 randomly selected respondents. The test is done visually by applying aromatherapy stick to the skin of the back of the hand then observing whether the aromatherapy stick is able to stick when applied to the skin with several times of basting.

Color and Odo

Testing of color and odor changes involves involving 30 randomly selected respondents, then respondents evaluate the preparation by observing changes in color and odor during 28 days of storage

Skin irritation test

Skin irritation test involved 30 respondents who were

randomly selected. Testing was done by applying preparations (F1, F2, F3, F4, F5, F6) on the back of the hand as wide as 2.5 x 2.5 cm [8] Then observe possible reactions such as itching, redness and stinging.

**III. RESULTS**

**1. Physical Stability Test**

Physical stability was tested every week for 28 days storage including pH, melting temperature, homogeneity, smearing power, color, odor and testing of skin irritation. The observation of the stability of the aromatherapy stick's properties can be seen in the following table and figure:

**a. pH**

romatherapy stick	pH (hari ke)					Ket
	0	7	14	21	28	
Formula Kontrol	6,98	6,99	6,99	7,00	7,00	MS
Formula I	6,97	6,98	7,00	7,01	7,04	MS
Formula II	6,98	6,98	7,01	7,03	7,05	MS
Formula III	6,98	6,99	7,00	7,03	7,04	MS
Formula IV	6,99	6,98	7,00	7,02	7,05	MS
Formula V	7,00	7,00	7,01	7,04	7,04	MS
Formula VI	7,01	7,01	7,01	7,02	7,03	MS

Information :  
 MS: Eligible  
 pH that meets the requirements 4-8 (Aulton, 2002)

**b. Melting Temperature**

Aromatherapy stick	Suhu Lebur (hari ke)					Keterangan
	0	7	14	21	28	
Formula Kontrol	68	68	68	68	68	MS
Formula I	66	67	68	68	69	MS
Formula II	65	66	67	68	68	MS
Formula III	65	66	66	68	68	MS
Formula IV	63	64	65	65	65	MS
Formula V	63	64	65	65	65	MS
Formula VI	64	66	67	68	68	MS

Information :  
 MS: Eligible Melting temperature that meets the requirements of 50° C-70° C (9).

**c. Homogeneity Test**

All preparations are homogeneous because when applied to the object glass there are no different granules or particles

**d. Applying Power**

All preparations that are attached to one application means that the preparations meet the requirements.

**e. Color and Odor**

All preparations do not experience a change in color and odor during storage, meaning that the preparations meet the requirements.

**f. Skin irritation test**

The questionnaire results show that 100% of respondents stated that they did not experience symptoms of irritation

**IV. DISCUSSION**

From the table, the results of the pH preparation ranges from 6.97-7.05 where the pH range is still able to be well tolerated by the skin [8]. Another thing that affects the ingredients contained in the formula does not cause skin irritation and the condition of the preparation of the aromatherapy stick is still good for 28 days of storage [10].

**V. CONCLUSION**

Based on the results of research and discussion of the physical stability of aromatherapy stick mixture of citronella oil (Oleum Citronella), cananga oil (Oleum Cananga), and patchouli oil (Oleum Patchouli) with variations of sodium lauryl sulfate as emulsifier for 28 storage days, it can be concluded that A mixture of citronella oil (Oleum Citronella), cananga oil (Oleum Cananga), and patchouli oil (Oleum Patchouli) can be formulated into a stable and aromatherapy stick preparation. The most optimal variation of sodium lauryl sulfate is at a concentration of 2%. The most stable and most preferred form of aromatherapy stick is Formula III with a mixture of citronella oil (Oleum Citronella), cananga oil (Oleum Cananga), and patchouli oil (Oleum Patchouli) by 3% and sodium lauryl sulfate by 2%. For PH, melting temperature, smearing power, homogeneity meets requirements and is physically stable. does not experience changes in odor, color and skin irritation does not occur when used.

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