

FORMULATION OF AROMATHERAPY OIL MAKING FROM RED LEMONGRASS (*Cymbopogon nardus*)

Titin Artika ¹, Evi Mustiqawati ^{2*}, Yayuk Sri Rahayu ³

^{1,2,3}Politeknik Baubau, Baubau, Indonesia

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CORRESPONDING AUTHOR

Name : Evi Mustiqawati
Address: Jl. Hayam Wuruk kel. Bone-bone, kec. Betoambari kota baubau
Email : evi.mustiqawati02@gmail.com

A B S T R A C T

Essential oils from various plants, including red lemongrass, are the main ingredients in making aromatherapy oils. Aromatherapy is a treatment method that generally uses essential oil vapors from various plants that are inhaled to cure various diseases. Aromatherapy is usually used to improve the health of the body, mind, soul, mood, and cognitive areas as well as an additional treatment. This study aims to determine the formulation of making aromatherapy oil from red lemongrass (*Cymbopogon nardus*) and to determine the results of the evaluation of the physical properties of red lemongrass oil aromatherapy preparations (*Cymbopogon nardus*). This study is an experimental study with 4 formulations, namely F1, F2, F3 and F4. The results of the organoleptic evaluation showed that the oil was yellow and had a distinctive odor of methol, camphor and red lemongrass. The results of the pH evaluation showed that this aromatherapy oil preparation was good as seen from the values obtained, namely 6.63-6.82 and was included in the category of good pH for the skin, namely 4.5-7.5. The results of the Viscosity evaluation showed that this aromatherapy oil preparation was good as seen from the values obtained, namely 19.69 cp-54.72 cp. 20 panelists with organoleptic parameters of the preparation against color, odor, and skin sensation were asked to determine their level of preference for the product. The results showed that F3 (2%) had good physical properties and had a high level of preference among 20 panelists.

INTRODUCTION

The pharmaceutical field is part of the world of health, and is closely related to health products and services (Mustiqawati *et al*, 2023). Indonesia's biological natural resources are very diverse because of their tropical nature. This diversity is particularly beneficial, especially since there are many plant species that can be used as medicines (Wa Jumi *et al*, 2023). Due to the many advantages offered by traditional medicines, these plants and medicinal plants have been used for generations. Some of the advantages offered by traditional medicines include ease of access, lower costs, the ability to be self-formulated, and lower levels of side effects compared to medicines derived from pharmaceutical products (Fitriani *et al* 2013).

One of the plants that is useful and easy to find is red lemongrass (*Cymbopogon nardus*). The red lemongrass plant (*Cymbopogon nardus*) is an aromatic plant that is easy to preserve and is able to grow in various environmental conditions (Susilowati and Syukur, 2022).

Red lemongrass leaves contain oils such as 35.97% citonellal, 17.28% geraniol, 10.03% citonellol, 4.44% geranyle acetate, 4.38% elemol, 3.98% limonene, and 3.51% citronellyle acetate (Mumba and Rante, 2020). In addition, red lemongrass leaves have secondary metabolites such as flavonoids, saponins, tannins, steroids, phenolics, and polyphenols (Fitria *et al.*, 2023).

Some studies on the benefits of red lemongrass (*Cymbopogon nardus*), namely the Arcani 2017 study, ethanol extracts of red lemongrass leaves and stems (*Cymbopogon nardus*) have effectiveness as a larvicide to control *Aedes aegypti* mosquitoes. Research Fitriani *et al* 2013 reported that red lemongrass leaf extract (*Cymbopogon nardus*) is effective as an anti-fungi of *Candida albicans*. Roots, stems and leaves of citronella or red lemongrass, Setiyowati research, 2021 Antioxidant compounds of citronella or red lemongrass have the ability to prevent SARS-CoV2 through increasing cellular immunity and affecting the number of lymphocytes and leukocytes. Based on the research of Fitria *et al.* 2023, the n-hexane fraction of red lemongrass is reported to have antioxidant activity of 8.23 ppm, which is categorized as very strong. Phenolic bioactive compounds and flavonoids have an effect on antioxidant activity. This study was conducted to determine phytochemical compounds, total phenolic and flavonoids from red lemongrass leaf extract and fraction (Desti, 2022).

Aromatherapy comes from the vapors of essential oils in various plants to cure various diseases. Aromatherapy is commonly used to improve the health of the body, mind, spirit, mood, and cognitive areas. In addition, it can also be used as part of other medications (Kurniasari *et al*, 2017). Hypertension in the elderly is strongly linked to health and lifestyle risk factors. The following health habits increase the risk of hypertension in the elderly (Syafriah *et al*, 2024).

Essential oils, also known as essential oils, etheric oils, fly oils, or aromatic oils, are a type of vegetable oil that takes the form of a viscous liquid at room temperature that is volatile and produces a unique aroma. These essential oils are often used in the manufacture of natural rubbing oils or perfumes for medicine. Essential oils that have been refined are usually referred to as perfume seeds in the market. Due to its complex, long, and difficult production process, the trade in pure essential oils is very limited (Sylvi *et al*, 2023).

Koensoemardiyah Apt, SU, an aromatherapist, states that the compounds contained in essential oils enter the body and affect the limbic system, which is the system that regulates emotions. Essential oil compounds have very fine and small-sized molecules, known as nano patikels. When the aroma of essential oils is inhaled by the nose, the molecules bind to the receptors that capture the aroma. Furthermore, the chemical signals from the material will reach the brain's limbic system through nerve pathways. The system regulates individual emotions. Arousing the spirit encourages the body to heal itself (Koensoemardiyah, 2009).

Based on the above statement, it can be concluded that red lemongrass oil can be used as aromatherapy on the grounds that the chemical content in the oil has been proven to have significant health benefits, while its refreshing aroma can provide a calming effect. In addition, its protective properties against insects are also an added value that makes it an attractive option for use in aromatherapy. Therefore, the use of oil from red lemongrass as aromatherapy can provide real benefits for human health and well-being.

METHODOLOGY

The research was conducted in July 2024 and took place at the Pharmacy Laboratory of Halu Oleo Kendari University. In this study, a variety of tools were used, including analytical scales, stirring rods, spatels, ph meters, Brookfield viscometers, measuring cups, beaker glasses, mortars and stampers, filter paper, droppers, containers, and distillation tools. In this study, various ingredients were used, namely camphora, menthol, olive oil and lemongrass oil.

Research Procedure

Distillation of Red Lemongrass (*Cymbopogon nardus*)

Distillation is used to obtain the essential oil of red lemongrass (*Cymbopogon nardus*). The leaves and stems of red lemongrass (*Cymbopogon nardus*) are sliced into smaller pieces and then stored into a round base flask and heated using a heating coat, after which a condenser is attached to convert the hot steam into water droplets so that it becomes oil then accommodated into Erlenmeyer and covered using aluminum foil to prevent evaporation.

Aromatherapy Oil Manufacturing

Table 1. Aromatherapy Oil Formula

Composition	Function	Concentration %			
		F1	F2	F3	F4
1. Red Lemongrass Oil	Active substances	0	1	2	3
2. Bulb	Corigen	10	10	10	10
3. Camphora	Antiirita	4	4	4	4
4. Olive Oil	Additives	Ad 10 mL	Ad 10 mL	Ad 10 mL	Ad 10 mL

The scale for each ingredient is 10 milliliters per formula. Drain the camphora and menthol with mortar until melted. Then transfer it to a beaker and mix the olive oil and lemongrass oil evenly. Put the aromatherapy oil in the prepared container.

Evaluation of the Physical Properties of the Preparation

Organoleptic Test

The organoleptis test is also referred to as a sensory test that uses the human senses to determine the receptivity of the product. This is done to maintain the quality of raw materials, product quality, and market growth. To test the preparation, its shape, color and smell are observed.

pH Test

To find out how acidic or alkaline the solution or liquid is, a pH test is performed. Before using the pH meter tool, standard solutions with pH 7 and pH 4 must be calibrated first. After that, 10 milliliters of the preparation are mixed into a pH meter and wait until the pH value of the preparation is displayed. The inspection process was carried out three times.

Viscosity Test

In liquid preparations, viscosity tests are carried out to determine the viscosity and flow properties. Brookfield viscosity is used to test viscosity. Once the sample is inserted into the beaker, install the spindle, as shown in number 2, and lower the beaker until the limit of the spindle is dipped into the sample. Then set the speed to 50 rpm. The viscosity value of the preparation is displayed on the monitor.

Likeness Test

This test is to determine how much the respondent likes the organoleptis parameters of the preparation or product of pliers. To conduct the preference test, twenty respondents were asked to tell their favorite skin color, scent, and sensation. The types of liking ratings consist of dislike (with a score of zero), somewhat like (with a score of one), like (with a score of two), and very like (with a score of three). Each favorite category is awarded. The preference value for each formula is limited by the respondent's total score and score.

Data Analysis

Aromatherapy oil with the active ingredient red lemongrass was found through quantitative and qualitative analysis of the preparation evaluation test.

RESULTS & DISCUSSION

In the research on the formulation of aromatherapy oil from red lemongrass (*Cymbopogon nardus*), the author used a sample in the form of red lemongrass (*Cymbopogon nardus*). The sampling location of red lemongrass (*Cymbopogon nardus*) is in Lowu-lowu village, lea-lea district, Baubau city, the research location is at the Pharmacy Laboratory of Halu oleo Kendari University.

Organoleptic Test

The organoleptic test has the goal of measuring the physical shape of the preparation through the observation of shape, color, and odor. The results of organoleptic testing on lemongrass aromatherapy oil preparations are shown below.

Table 2. Organoleptic Test Results

No.	Sample Name	Interpretation	Information
1.	Formula I	The yellow color is clear, homogeneous, bauk has menthol and camphor, oil form, clear without coarse particles and easy to pour.	Good
2.	Formula II	The yellow color is clear, homogeneous, the characteristic smell of lemongrass, oily form, clear without coarse particles and easy to pour.	Good
3.	Formula III	The yellow color is clear, homogeneous, the characteristic smell of lemongrass, oily form, clear without coarse particles and easy to pour.	Good
4.	Formula IV	The yellow color is clear, homogeneous, the characteristic smell of lemongrass, oily form, clear without coarse particles and easy to pour.	Good

Aromatherapy wind oil made from lemongrass oil has shown good results. Wind oil (F1, F2, F3, and F4) is clear yellow, homogeneous, has a distinctive smell of camphor bulbs to serei, oily shape, clear without coarse particles, and easy to pour. The more red serie aromatherapy oil is present in the red serie aroma formula, the stronger the aroma, as indicated by F4.

pH Test

To determine the level of acidity or alkalinity, the pH test is carried out from a solution or liquid, the following is a table of pH test results on red aromatherapy oil preparations.

Table 3. pH Test Results

No.	Sample Name	Ph	Information
1.	Formula I	6,82	Good
2.	Formula II	6,74	Good
3.	Formula III	6,88	Good
4.	Formula IV	6,63	Good

The pH test shows that the pH of the preparation ranges from 6.63-6.82 for the formulas F1, F2, F3, and F4. The results showed that the concentration of lemongrass aromatherapy oil increased along with the decrease in pH of the preparation. This is due to the pH of sour red lemongrass oil (Sibilang et al., 2017). Therefore, along with the amount of lemongrass oil in the formula, the pH of the preparation will also be lower. The pH value of aromatherapy preparations that are safe for the skin is between 4.5 and 7.5. A pH value that is too acidic or too alkaline will cause irritation to the skin.

Viscosity Test

In liquid preparations, viscosity tests are carried out to determine the viscosity and flow properties. Viscosity test using *Brookfield Viscosity*, the following is a table of viscosity test results on red aromatherapy oil preparations.

Table 4. Viscosity Test Results

No.	Sample Name	Viscosity	Information
1.	Formula I	32,49 cp	Good
2.	Formula II	54,72 cp	Good
3.	Formula III	38,70 cp	Good
4.	Formula IV	19,69 cp	Good

In liquid form, viscosity tests are carried out to determine the viscosity and flow properties. How a topical preparation spreads and adheres to the skin is affected by its viscosity. Good topical preparations have good spread and adhesion to the skin because the active substances can be consistently distributed and applied to the surface of the skin constantly, thus maximizing the therapeutic effect (Pradal et al., 2019). The results of the study stated that the viscosity of F1 was 32.49 centipoise, F2 was 54.72 centipoise, F3 was 38.70 centipoise, and F4 was 19.69 centipoise.

Likeness Test

To find out how much respondents like the parameters, an organoleptic preference test of the product or preparation is carried out. Organoleptic parameters include color, aroma, and skin taste sensation to measure respondents' liking for the product used. Organoleptic preparations are concerned with the presentation of products because they describe the quality of the product as judged by the human senses. (Ismawati et al., 2020).

Table 5. Preference Test Results

Indicator	Sample			
	F I	F II	F III	F IV
Color	40	37	40	38
Aroma	25	37	38	30
Skin Sensation	47	47	49	47

The results stated that the respondents liked wind oil and red lemongrass aromatherapy oil with moderate concentrations, 1% and 2%, respectively. F1 and F3 have the same total score on the color parameters of the preparation, while F4 has the lowest total score on the color test. On the skin sensation parameter, F3 has the highest total score. This shows that the respondents have an interest in the aromatherapy wind oil preparation F3, which contains 2% red lemongrass oil.

Koensoemardiyah Apt, SU, an aromatherapist, states that the compounds contained in essential oils enter the body and affect the limbic system, which is the system that regulates emotions. Essential oil compounds have fine and small molecules, known as nano patikels. When the aroma of essential oils

is inhaled by the nose, its molecules bind to the receptors that capture the aroma. Furthermore, the chemical signals from the material will reach the brain's limbic system through nerve pathways. The system regulates a person's emotions. Boosting the spirit encourages the body to heal itself.

CONCLUSION

Based on the results of the research on the Formulation of Aromatherapy Oil from Red Lemongrass (*Cymbopogon nardus*), it can be concluded that the formulation of Aromatherapy Oil from Red Lemongrass (*Cymbopogon nardus*) with 4 different formulations meets both physical and chemical standards as seen from organoleptic tests, pH tests, viscosity tests and preference tests. Results of evaluation of the physical properties of aromatherapy preparations of lemongrass oil (*Cymbopogon nardus*). The results of the organoleptic evaluation showed yellow oil and a distinctive smell of metol, camphor and lemongrass. The results of the pH evaluation showed that this aromatherapy oil preparation was good to see from the value obtained, which was 6.63-6.82 and was included in the pH category that was good for the skin, which was 4.5-7.5. The results of the viscosity evaluation showed that this aromatherapy oil preparation was good to see from the value obtained, which was 19.69 cp-54.72 cp. The results of the preference test stated that respondents preferred F3 aromatherapy oil preparations, which contain 2% red lemongrass oil. In this study, there are limitations in equipment, especially distillation equipment, therefore the researcher made distillation at the Pharmacy Laboratory of Halu Oleo University.

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