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UTILIZATION OF ARABICA COFFEE WASTE (coffea arabica) AS AN ADDITIVE IN THE PRODUCTION OF AROMATHERAPY CANDLES (scanted candle) USING PARAFFIN AND STEARIC ACID AS RAW MATERIALS

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ABSTRACT

Aromatherapy candles are an alternative application of aromatherapy through inhalation, producing aromas that provide therapeutic effects when burned. They serve as alternative medicine, decoration, and room fragrance. The purpose of creating aromatherapy candles is to enhance home decor while supporting a healthy living aroma through the therapeutic process. This research was conducted to formulate and test the physical properties of aromatherapy candles using a combination of stearic acid and additives (coffee). Natural materials that can be used for making aromatherapy candles include coffee grounds. Physical property tests were carried out, including organoleptic tests, burn time tests, flame height tests, and melting point tests. The best research result for stearic acid was 6 grams in sample 1 with 30 grams of coffee grounds. The best result for flame height was 2 grams in sample 1 with 10 grams of coffee grounds, and the best melting point result was 30 grams of coffee grounds with a melting point of 50-58°C. This research was conducted according to the SNI standard for aromatherapy candles.

Keywords: *Aromatherapy Candles, Essential Oil, Paraffin, Stearic Acid*

1. INTRODUCTION

In Simpang Rangkaya, Tanah Luas District, there are many stalls selling coffee drinks, but the coffee grounds from these beverages are discarded. Therefore, I want to reduce waste by utilizing these coffee grounds to make aromatherapy candles as an additive using paraffin and stearic acid as raw materials.

Candles are materials made from paraffin, which melt easily when heated and can be used as lamps or for batik (KBBI, 2017). Natural aromatherapy candles are certainly better than synthetic fragrances, as the latter can adversely affect the health of those inhaling them (Minah et al., 2017). Candles have been widely used throughout history not only as a source of light but also as a means to set the mood. The candles in question are aromatherapy candles. Aromatherapy candles contain fragrant materials that offer many benefits, such as refreshing, relaxing, alleviating headaches, reducing stress and anxiety, improving mood, and addressing insomnia. Natural aromatherapy candles are indeed better than synthetic fragrances, which can harm the health of those who inhale them (Minah et al., 2017). One natural ingredient that can be used for these aromatherapy candles is coffee.

In Indonesia, there is currently a coffee trend, marked by the proliferation of cafes and coffee shops on every corner, and people can even order coffee online. However, this has led to a significant amount of coffee grounds being wasted and not utilized. Coffee grounds have numerous

benefits, one of which is as an odor neutralizer. The presence of coffee grounds waste can be transformed into a marketable product, specifically aromatherapy candles made from coffee grounds with a composition of essential oil, paraffin, and stearic acid.

Essential oil functions to produce a fragrant aroma, while paraffin is the raw material used in candle making as fuel. Stearic acid serves to improve the consistency of the candle flame. The advantages of using aromatherapy candles include energy efficiency, as they do not require electricity, and minimal side effects since they do not contain harmful chemicals. The price of aromatherapy candles is also more affordable, and their usage is easier, simply requiring burning compared to using a diffuser. Therefore, there is a need for alternative plant materials that can provide aromatic effects and contain essential oils suitable for aromatherapy.

Thus, the author intends to conduct this research to explore the utilization of coffee grounds and turn them into a basic material for making aromatherapy candles as an odor neutralizer. The author will also distribute a questionnaire to gather observational data that can be accumulated as results to understand the benefits of using coffee grounds waste as an odor neutralizer.

RESEARCH AND METHOD

Material and Equipment

The materials used in this research include: coffee grounds, essential oil, paraffin, distilled water (aquadest), stearic acid, and candle wicks (cotton thread). The tools used in this research include: a knife, tray, scale, 1000 mL beaker, spoon, stove, hot glue gun, thermometer, melting container, wooden tongs, aesthetic jars/containers, hot plate, and cloth.

Making Aromatherapy Candles

The process of making aromatherapy candles begins by preparing a melting container on the stove, then adding enough distilled water (aquadest) into the container. Next, prepare a 1000 mL beaker and add 600 grams of paraffin. Heat the paraffin until it reaches a temperature of 80°C. After that, prepare an aesthetic container and attach the candle wick in the center using a hot glue gun.

To ensure the wick stays in place, clamp the top of the wick with wooden tongs. Once the paraffin has melted, pour it into the 25 prepared aesthetic containers. Add 2.3 mL of essential oil to each container, then add stearic acid according to the specifications for each container. Stir the mixture with a spoon until evenly combined, and then add the coffee grounds according to the predetermined measurements for each container. After all the ingredients are mixed, wait for the candles to harden for 2 hours. Once the drying process is complete, the candle products will enter the testing phase before being packaged for sale.

Testing

The testing procedure for the aromatherapy candles includes several stages to ensure product quality. First, for the melting point test, prepare a sample of the hardened candle and place it in a beaker that is set in a pot of water. Heat the water using a hot plate until it reaches a temperature of 125°C, then attach a thermometer to a clamp to observe and record the temperature at which the candle begins to melt.

Next, the burn time test is conducted by lighting the candle in a room and recording the duration it takes for the candle to burn completely. The flame height test is also performed by lighting the candle in the same room, where the difference in flame height among the tested samples will be observed.

The organoleptic test aims to assess consumer acceptance of the scented candle product containing coffee additive. The criteria used in this test include aroma and color, with a rating scale ranging from dislike to like very much. Finally, the hedonic test involves analyzing color, aroma, and texture by 20 untrained panelists.

The panelists will be instructed to fill out a questionnaire, using commercial shortening as a reference for evaluation. For the aroma test, panelists will use their sense of smell, while for color, they will use their sense of sight. For texture, panelists will first feel the commercial shortening before analyzing the produced sample. After each test, the panelists will fill out the questionnaire according to the predetermined hedonic scale.

RESULTS AND DISCUSSION

1. The Effect of Coffee Additive on the Production of Scented Candles

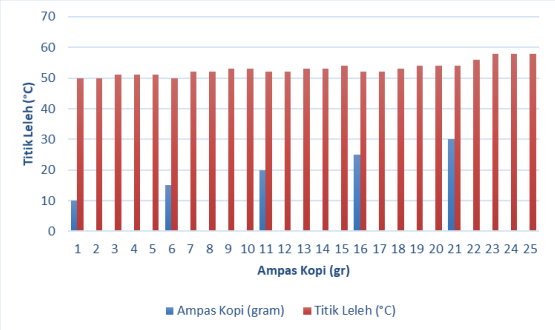

Figure 1. The Effect of Melting Point with Coffee Additives

The coffee additive significantly affects the melting point and aroma of the candles. The higher the melting point, the stronger the aroma produced. From the research, aromatherapy candles with the addition of coffee additive at concentrations of 10, 15, 20, 25, and 30 grams showed that a concentration of 30 grams yielded the best results. The melting point at this concentration reached 58°C, in accordance with SNI 0386–1989–A/S11 0348. A longer burning process also increases aroma intensity; however, it is important to ensure that the room where the candle is burned is enclosed, with a maximum size of 3x4 meters.

2. The Effect of Stearic Acid Composition on the Production of Scented Candles

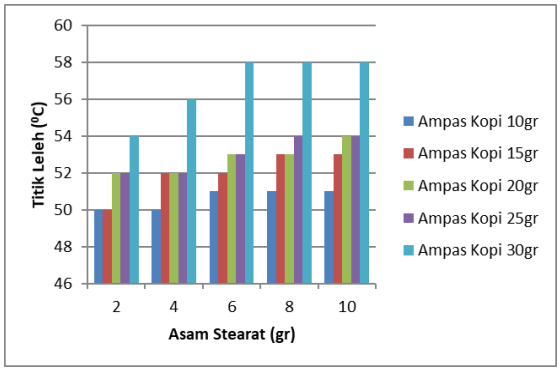

Figure 2. The Effect of Melting Point with Stearic Acid

Stearic acid plays a role in increasing the melting point of the candle and the consistency of the flame. From the tests, the optimal concentrations of stearic acid were found to be 6, 8, and 10 grams, where the more stearic acid used, the longer the candle's burn time. However, the height of the flame also needs to be monitored; a higher flame can produce smoke that is harmful to health. The ideal flame height for samples with the addition of stearic acid is at 8 grams.

3. Flame Height Test

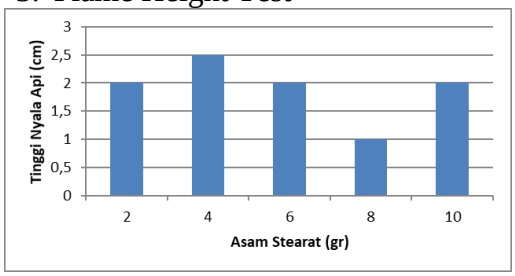

Figure 3. The Effect of Flame Height with Stearic Acid

The flame height test was conducted by lighting the candle in a room and observing the flame height. The results showed that the highest flame occurred with the addition of 4 grams of stearic acid, while the lowest was with the addition of 8 grams. Excessive flame height can cause smoke and accelerate the burning of the candle, so a good flame height is achieved with the addition of 8 grams of stearic acid.

4. Burn Time Test

The burn time of the aromatherapy candles showed consistent results, without significant influence from the tested variables. Observational data indicated that the burn time remained stable across all samples.

5.Organoleptic Test (Color and Aroma

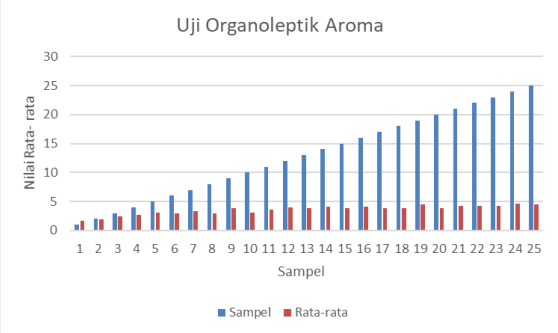

Figure 4. Organoleptic Test on Aroma

The organoleptic test was conducted to determine the preferences of the panelists regarding the product. Involving 15 panelists, the parameters tested included color, aroma, and texture. Assessment was carried out using a hedonic scale from 1 (dislike very much) to 5 (like very much). The results indicated that the more coffee grounds used, the stronger the aroma of the produced candle.

CONCLUSIONS

Based on the results of the research conducted, it can be concluded that the coffee additive has a significant effect on the melting point and aroma in the production of aromatherapy candles. The higher the melting point, the stronger the aroma produced, and the use of more coffee grounds will enhance the intensity of that aroma. Additionally, the composition ratio of stearic acid and paraffin also affects the height and size of the flame. Excessive flame height is not good for aromatherapy candles as it can produce smoke, which may be harmful to health. Therefore, it is important to regulate the composition and burning conditions so that the aromatherapy candles can function optimally and safely.

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