



## Patchouli Oil Innovation in Making Peel-Off Masks to Inhibit Acne Bacteria

Elly Sufriadi<sup>1,2\*</sup>, Tiara Novebrina<sup>1,2</sup>, Syaifullah Muhammad<sup>2,3</sup>, M. Dirhamsyah<sup>2,4</sup>

<sup>1</sup>Department of Chemistry, Universitas Syiah Kuala, Banda Aceh 23111, Indonesia

<sup>2</sup>ARC-PUIPT Nilam Aceh-Atsiri Research Centre, Universitas Syiah Kuala, Banda Aceh 23111, Indonesia

<sup>3</sup>Department of Chemical Engineering, Universitas Syiah Kuala, Banda Aceh 23111, Indonesia

<sup>4</sup>Department of Mechanical Engineering, Universitas Syiah Kuala, Banda Aceh 23111, Indonesia

\*Corresponding author email address: [elly.sufriadi@usk.ac.id](mailto:elly.sufriadi@usk.ac.id)

Received: 2 November 2022; Accepted: 25 December 2022; Published online: 30 December 2022

### Abstract

One of the plants that produce essential oils is patchouli. Patchouli contains patchouli oil which has many benefits, including as an antibacterial, antioxidant, and can be used in perfume mixtures. In this study, patchouli oil was used in the manufacture of peel-off masks. This study aims to test the ability of peel off masks as antibacterial which can inhibit acne-causing bacteria. The results of this study are peel-off mask can inhibit the growth of acne-causing bacteria, namely *Staphylococcus aureus*. The clear zone formed is 11.8 mm, which indicates that the peel-off mask has a strong inhibitory power to inhibit the growth of acne-causing bacteria. Peel-off masks have a thick texture, white colour, and are easy to peel off when dry. The results of this study provide information for the development of Peel-Off masks as antibacterial, especially for the cosmetic and health fields

**Keywords:** antibacterial, patchouli innovation, patchouli oil, peel-off mask, *staphylococcus aureus* bacteria

### 1. INTRODUCTION

Indonesia is one of the countries with a high level of biodiversity, there are various types of plants. Plants found in Indonesia have various benefits including in terms of treatment, food, clothing, shelter, beauty, and economy (Wali et al. 2022). One of the uses of plants in the medical world is the use of essential oils. Essential oils or essential oils are Indonesian export commodities that have been known since the Dutch colonial era. However, until now the export of this commodity has not had encouraging developments both in terms of volume, export value, and quality of processed products. Lutony and Rahmayati (1994), explained that there are 70 types of essential oils traded in the world, 40 of which can be produced in Indonesia. The consumption of essential oils and their derivatives worldwide has increased by around 8-10%, including in Indonesia, India, Thailand, and Haiti (Dosoky and Setzer 2018).

The increase was because people have begun to realize the importance of essential oils for the perfume, cosmetic, and health industries (Kant and Kumar 2022). In addition, people's mindsets have begun to change from consuming synthetic compounds to natural ingredients, thus contributing to an increase in the demand for essential oils. The type of essential oil that is widely consumed domestically and has a relatively high economic value is patchouli oil (Kapadia et al. 2022).

The active ingredients of patchouli such as saponins, triterpenoids, tannins, flavonoids, and alkaloids are known to have antibacterial and antiviral activity (Boutakiout et al. 2022; Isnaini et al. 2022). Patchouli plant can function in healing and removing scars, as an antioxidant, can be used as aromatherapy, and as an ingredient in perfume mixtures (Muhammad et al. 2022). Not only can it be used as medicine, but patchouli can also be used, especially in skincare products (Isnaini et al. 2022).

Currently, skincare is starting to get attention, which is in addition to beauty as well as treatments that support skin health (Pisanti et al. 2022). Facial skincare is available in various dosage forms, one of which is a peel-off gel mask (Salem et al. 2022). Peel-off gel masks have several advantages including easy use, dry quickly, can be removed or removed without causing pain, and do not require water to rinse, making them more practical to use (Armady and Hasnawati, 2017). In this study, the content of the ingredients above, namely patchouli oil (*Pogostemon cablin* Benth.) which is formulated in the form of a peel-off mask, will be tested for its ability to inhibit the activity of acne-causing bacteria such as *Staphylococcus aureus*.

### 2. MATERIALS AND METHODS

#### 2.1 Material

The materials used in this study were patchouli oil (*Pogostemon cablin* Benth), polyvinyl alcohol, carbomer,

propylene glycol, methylparaben, Nutrient Agar (NA) media, *Staphylococcus aureus* bacteria, alcohol, blank disk, and aquadest.

## 2.1 Procedure

A 8.5 g polyvinyl alcohol is developed into hot water until the solution is homogeneous. Then 1 g carbomer in different containers was developed with hot water until homogeneous and clear. Then added 0.1 g methylparaben which had been dissolved in 6 g propylene glycol. Then 1.5 g patchouli oil was added to the formula and stirred until homogeneous. As information, patchouli oil quality can be improved by vacuum distillation to obtain hi-grade quality (Muhammad et al. 2022).

Then the mask was tested for antibacterial using a blank disk that had been dipped in the peel-off mask formulation and then put into a petri dish containing *Staphylococcus aureus* bacteria. Then incubated at 37 °C for 1 x 24 hours.

## 3. RESULTS AND DISCUSSIONS

### 3.1 Preference test

The peel-off mask formulation is thick in texture, white in colour, has a distinctive patchouli odour, is easy to use, and is easy to peel off when dry (Figure 1). The adhesive power of the peel-off mask formulation on the skin is good and can be peeled off when it is dry. Adhesion in this study was done by applying the gel to the skin on the back of the hand. The results of the adhesion test aim to show the ability of the preparation to adhere to the skin so that it can provide maximum effect.



Figure 1. Peeling off the mask from skin

The antibacterial test in this study used the blank disk method (Figure 2). The advantage of this method is that it is fast and easy to use because it does not use special tools. Based on the results of research that has been done, it is known that patchouli oil has an inhibitory power against *Staphylococcus aureus* bacteria. Antibacterial activity was indicated by the presence of an inhibition zone in the form of a clear zone, which is an area that is not overgrown with bacteria around the paper disk.

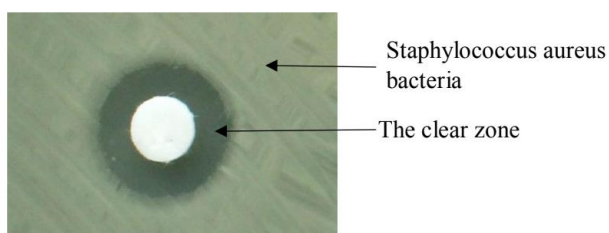


Figure 2. Antibacterial Documentation

Nazri et al. (2011) stated that the 0-5 mm inhibition zone had weak inhibitory activity, the 5-10 mm inhibition zone had moderate inhibitory activity, the 10-20 mm inhibition zone had strong inhibitory activity, and the inhibition zone > 20 mm has a very strong inhibitory activity. The clear zone formed in this study was 11.8 mm. This indicates that the inhibitory zone on patchouli has strong antibacterial activity.

## 4. CONCLUSIONS

The peel-off mask formulation has strong antibacterial activity. This is indicated by the formation of a clear zone of 11.8 mm. Based on this, it can be said that patchouli peel-off masks can inhibit acne-causing bacteria.

## ACKNOWLEDGMENTS

The authors would like to thank the Atsiri Research Centre (ARC) PUIPT Nilam Aceh Universitas Syiah Kuala which had provided the materials and tools as well as expert feedback to ensure this research runs smoothly.

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