

Room Freshener From a Mixture of Orange Peel, Clove and Cinnamon CloZinPeel(Clove + Cinnamon + Peel)

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Abstrak

Studi ini bertujuan untuk mengembangkan penyegar ruangan ramah lingkungan menggunakan kulit jeruk manis (*Citrus sinensis*), cengkeh (*Syzygium aromaticum*), dan kayu manis (*Cinnamomum verum*) dalam bentuk diffuser batang. Penyegar sintetis sering dianggap tidak menyenangkan karena aromanya yang kuat, sementara alternatif alami memberikan aroma yang lebih lembut dan menenangkan. Kulit jeruk, yang biasanya dianggap sebagai limbah, mengandung senyawa bioaktif seperti limonene dan citral, yang bertindak sebagai agen pewangi alami. Dikombinasikan dengan eugenol dalam cengkeh dan cinnamaldehyde dalam kayu manis, bahan-bahan alami ini menawarkan manfaat antimikroba dan aromatik. Ekstraksi dilakukan menggunakan peralatan Soxhlet dan DOWANOL sebagai pelarut. Produk dievaluasi melalui pengujian organoleptik yang melibatkan 25 responden. Hasil menunjukkan bahwa 52% peserta "menyukai" produk tersebut, 16% "sangat menyukainya", sementara hanya 12% "tidak menyukainya". Temuan ini menunjukkan bahwa formulasi tersebut diterima dengan baik dan memiliki potensi sebagai produk berkelanjutan. Penggunaan limbah kulit buah sebagai bahan pewangi tidak hanya mendukung pengurangan limbah tetapi juga mendorong pengembangan barang konsumsi yang ramah lingkungan.

Kata kunci: penyegar ruangan, kulit jeruk, cengkeh, kayu manis, diffuser buluh, produk ramah lingkungan

Abstract

This study aims to develop an eco-friendly room freshener using sweet orange peel (*Citrus sinensis*), clove (*Syzygium aromaticum*), and cinnamon (*Cinnamomum verum*) in the form of a reed diffuser. Synthetic fresheners are often perceived as unpleasant due to their strong aroma, while natural alternatives provide a softer and more relaxing fragrance. Orange peel, typically considered waste, contains bioactive compounds such as limonene and citral, which act as natural fragrance agents. Combined with the eugenol in clove and cinnamaldehyde in cinnamon, these natural ingredients offer antimicrobial and aromatic benefits. Extraction was performed using Soxhlet equipment and DOWANOL as solvent. The product was evaluated through organoleptic testing involving 25 respondents. Results showed that 52% of participants "liked" the product, 16% "strongly liked" it, while only 12% "disliked" it. These findings indicate that the formulation was well accepted and has potential as a sustainable product. The use of fruit peel waste as a fragrance ingredient not only supports waste reduction but also promotes the development of environmentally friendly consumer goods.

Keywords: room freshener, orange peel, clove, cinnamon, reed diffuser, eco-friendly product



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INTRODUCTION

Room fresheners are increasingly in demand by society due to their ability to provide olfactory stimulation, which can influence psychological conditions and human behavior. In general, room fresheners are available in various forms such as gels and sprays, containing either synthetic or natural compounds. Synthetic fresheners

often cause discomfort because of their sharp and strong aroma, whereas natural fresheners tend to produce a softer and more pleasant scent (Setyaningsih & Nugraheni, 2021).

One natural material with significant potential to be utilized is sweet orange peel (*Citrus sinensis*), which has often been considered waste. Orange peel is known to contain essential oils with active compounds such as limonene, terpene, aldehyde, and ester, which play an important role as biofragrance agents (Bicas et al., 2011). The use of orange peel as a raw material in reed diffuser formulations not only contributes to the development of environmentally friendly (eco-friendly) products, but also supports waste reduction and sustainable development.

In addition to orange peel, other natural ingredients such as clove and cinnamon also show potential to be used as mixtures in room freshener formulations. Cinnamon contains various bioactive compounds, including essential oils, eugenol, safrole, cinnamaldehyde, tannins, calcium oxalate, resin, and natural dye. Meanwhile, clove contains a high amount of eugenol, which is well known for its antiseptic and analgesic properties. This compound has also been reported to help relieve mental fatigue (Pandey et al., 2024).

Based on the potential of sweet orange peel waste, cinnamon, and clove, this study utilizes these three ingredients as the main basis in the formulation of room freshener products in the form of reed diffusers. This utilization is expected not only to produce environmentally friendly products, but also to provide added value to waste materials and make use of abundant natural resources.

RESEARCH METHOD

This research was carried out through several main stages, including: collection of raw materials, material preparation, extraction process, and formulation of reed diffuser using natural extracts of sweet orange peel, clove, and cinnamon as natural fragrance agents, along with analysis of the final product.

The equipment used in this study included a set of Soxhlet extraction tools, siphon, pipet, glassware (beakers, measuring cylinders, flasks), analytical balance, magnetic stirrer, spatula, glass funnel, pipettes, rubber bulb, dropper, wax melting pitcher, and a distillation apparatus. The materials used in the research process consisted of sweet orange peel (*Citrus sinensis* L.) weighing 200 grams, clove (... grams), cinnamon (... grams), and DOWANOL as the solvent, with evaporation serving as the carrier of the fragrance.

Product analysis was conducted through organoleptic testing to evaluate the physical characteristics of the essential oils produced. The parameters observed included aroma (scent), visual appearance (color), and the level of comfort during use. The testing involved 25 respondents consisting of academic staff and students of SMP Islam Cendekia Cianjur. Each respondent was asked to provide an assessment of the physical characteristics of the product using a four-point hedonic scale, namely:

- 1 = dislike,
- 2 = fair,
- 3 = like,
- 4 = strongly like.

The data obtained from the organoleptic test were then analyzed descriptively to determine the level of preference for each parameter tested.

RESULT AND DISCUSSION

The essential oil from sweet orange peel (*Citrus sinensis*) produces a fresh and natural aroma that can be used as a basic ingredient for room fresheners. This oil has characteristics that are softer compared to synthetic fragrances, thus providing a sense of relaxation and comfort during use. This advantage makes orange peel an ingredient with great potential to be applied in reed diffuser products.

Sweet orange peel contains various chemical compounds that play an important role in producing its aroma. The main components include limonene (about 90% of the essential oil), which gives the citrus scent, as well as other compounds such as linalool, citral, myrcene, and α -pinene. Clove contains a high amount of eugenol as its dominant compound, while cinnamon contains cinnamaldehyde (about 70%) as its main active compound, along with eugenol, saffrole, tannins, calcium oxalate, resin, and natural dye. These bioactive compounds are known to provide antimicrobial, antiseptic, and analgesic benefits.

Organoleptic tests were carried out to evaluate the physical characteristics and aroma of the reed diffuser formulated using extracts of sweet orange peel, clove, and cinnamon. The parameters observed included aroma (scent), visual appearance (color), and comfort level during use. The results showed that the product produced had a pleasant, attractive aroma, good consistency, and was comfortable when applied as a room freshener.

The organoleptic test involved 25 respondents consisting of academic staff and students of SMP Islam Cendekia Cianjur (Arumi et al., 2021). The results are presented in Table 1.

Table 1. Organoleptic Test Results of Reed Diffuser from Sweet Orange Peel, Clove, and Cinnamon

Score	Category	Number of Respondents	Percentage(%)
1	Dislike	3	12,00%
2	Fair	5	20,00%
3	Like	13	52,00%
4	Strongly Like	4	16,00%
Total		25	100%

Based on Table 1, the majority of respondents (52%) stated that they liked the reed diffuser product made from sweet orange peel, clove, and cinnamon. About 16% of respondents gave a “strongly like” rating, while 20% rated it as “fair,” and 12% rated it as “dislike.” These results indicate that the reed diffuser formulation from natural ingredients is generally well accepted. This shows that the product has the potential to be developed further as a natural, pleasant, and environmentally friendly room freshener.

CONCLUSION

The essential oil from sweet orange peel (*Citrus sinensis*) produces a fresh and soft aroma that has the potential to be used as a basic ingredient for room fresheners. Dominant compounds such as limonene, linalool, and citral play an important role in forming the characteristic citrus aroma that provides a calming effect. The combination of essential oils from sweet orange peel, clove, and cinnamon in the reed diffuser formulation resulted in an aroma preferred by the majority of respondents. The organoleptic test showed that 68% of respondents stated that they liked or strongly liked the aroma produced. The utilization of orange peel as a fragrance ingredient not only creates an eco-friendly product but also supports the reduction of organic waste and efforts for sustainable development.

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REFERENCES

- [1] Ayuni, F., Rahmadani, A., & Harahap, I. A. (2021). Formulasi Minyak Atsiri Sebagai Bahan Pewangi Alami Reed Diffuser. *Jurnal Ilmu Kimia dan Terapan*, 8(2), 123–130.
- [2] Bicas, J. L., Neri-Numa, I. A., Ruiz, A. L. T. G., De Carvalho, J. E., & Pastore, G. M. (2011). Bioactive compounds from citrus by-products: Applications in food, cosmetics and pharmaceuticals. *Food Research International*, 44(7), 2252–2263. <https://doi.org/10.1016/j.foodres.2011.03.051>
- [3] Herz, R. S. (2009). Aromatherapy facts and fictions: A scientific analysis of olfactory effects on mood, physiology and behavior. *International Journal of Neuroscience*, 119(2), 263–290. <https://doi.org/10.1080/00207450802333953>



- [4] Pandey, R., Verma, R., & Mishra, N. (2024). Clove (*Syzygium aromaticum*): Pharmacological activities and applications in aromatherapy. *Journal of Herbal Medicine and Research*, 12(1), 45–53.
- [5] Setyaningsih, L. & Nugraheni, R. D. (2021). Pemanfaatan Minyak Atsiri Sebagai Aromaterapi untuk Menurunkan Tingkat Stres. *Jurnal Farmasi dan Ilmu Kefarmasian Indonesia*, 8(1), 12–18.