

Utilization of Banana Peel Mask as a Natural Solution for Prevention and Treatment of Acne in Teenagers

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Abstract

Acne is a common skin problem in adolescents, caused by hormonal imbalance, excess sebum production, and bacterial infection. Conventional acne treatment often uses chemicals that can cause side effects, such as skin irritation and antibiotic resistance. Therefore, natural alternatives that are safer and more effective are needed. This research uses the literature study method to analyze the potential of banana peels as a natural solution in the prevention and treatment of acne in adolescents. The results showed that banana peels contain lutein, vitamin C, and potassium, which have antioxidant, anti-inflammatory, and antibacterial properties, effective in reducing inflammation, killing acne-causing bacteria such as *Propionibacterium acnes*, and accelerating skin regeneration. Studies have also shown that banana peel extract can improve skin conditions without significant side effects, while being an environmentally friendly treatment solution. Thus, banana peel masks have the potential to be a safe, natural, and sustainable alternative to acne treatments, although further research is needed for clinical validation and formulation optimization.

Keywords: acne, banana peel extract, natural skincare, antibacterial



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Introduction

Acne is one of the most common skin problems in teenagers. Almost everyone has experienced the nuisance of acne. Acne is a chronic inflammatory process of the sebaceous glands. Acne is a skin condition that can vary in severity, ranging from mild with the appearance of blackheads to inflammatory conditions characterized by numerous pustules or cysts on the surface of the skin. The causes of acne are many including genetic, food factors, endocrine, sebaceous gland activity itself, infection, bacteria, cosmetics, and chemicals (Fauziah, 2014). These factors interact with each other, worsening skin conditions and increasing the risk of more severe acne. Apart from affecting skin health, acne can also have an impact on one's self-confidence and psychological well-being. In adolescents, the incidence of acne occurs with an age range of 14-17 years in females, and in males age range of 16-19 years (Wasitaatmadja, 2007). Currently, many acne treatment products are available in the market, but most of them use chemicals that can cause side effects such as irritation, dry skin, and antibiotic resistance. Therefore, a more natural, safe, and effective solution is needed in treating acne. Retinoic acid, the active form of vitamin A, is used to accelerate the regeneration of the skin, increase collagen production, and reduce sebum. While it is effective in acne and improving skin texture, its unsupervised use can cause irritation, redness may cause irritation, redness, and sun sensitivity (Ananda et al., 2025).

One of the natural ingredients that can be used for cosmetics is banana peel. Banana peels contain secondary metabolites including lutein, flavonoids, vitamin c, and tannins that are able to inhibit bacterial growth. Tannin compounds are antimicrobial by precipitating proteins, while alkaloid flavonoids proteins, while flavonoid alkaloids can inhibit bacterial growth. inhibit the growth of

bacteria *Staphylococcus aureus* and saponin compounds including triterpenoid compounds can be used as an antimicrobial substance (Zahiriyah et al., 2022). The benefits of banana peels are able to cure acne because banana peels contain, among others: antioxidant content is able to reduce acne and excess oil; anti-fungal helps to overcome itching and irritation on the skin. acne and excess oil; anti-fungal helps overcome itching and irritation on the skin, so that it can accelerate the healing process; helps remove dead skin cells, so as to prevent the risk of new acne coming due to oil blockage due to the obstructed by piles of dead skin cells; and able to brighten facial skin, so that red blemishes acne scars will fade (Saraswati, 2015). Banana peels contain various bioactive compounds, such as lutein, vitamin C, and potassium, which have antioxidant, anti-inflammatory, and antibacterial properties. This content plays a role in reducing inflammation, killing acne-causing bacteria, and accelerating the skin regeneration process. In addition to its benefits for skin health, the utilization of banana peels can also help reduce organic waste, making it a more environmentally friendly and sustainable skincare solution.

Currently, research on the benefits of banana peels in the treatment of acne is still growing. Some studies show that banana peel extracts contain active compounds such as antioxidants, antibacterials and anti-inflammatories that are effective in treating acne. These compounds help inhibit the growth of acne-causing bacteria, such as *Propionibacterium acnes*, and improve skin condition without causing significant side effects. Therefore, banana peel masks have the potential to be a safer and more natural alternative to chemical acne treatments that often cause side effects. In addition to its skincare benefits, the use of banana peels is also more environmentally friendly as it can reduce organic waste. Banana peels that are usually wasted can be utilized as a sustainable skincare ingredient. Given this great potential, this study aims to further explore the effectiveness of banana peel masks in preventing and treating acne, especially in adolescents who are prone to such skin problems.

Methods

The method used in this research is to conduct a literature study review. The research was conducted by reviewing sources derived from several relevant articles (Rahmadani et al., 2024). To find relevant literature, the keywords "Banana Peel Extract" the author uses a literature review from Sumiyati, S., & Ginting, M. (2019).

- a. Tools: Tools used in this research is: scales, spatulas, knife, plate, measuring cup, beaker glass, blender, mortar and stamper, sudip, plastic pot, oven, 20 mesh sieve, water bath. 20 mesh, water bath.
- b. Materials: Materials materials used in this study are: Banana peel powder, Polyvinyl alcohol, HPMC, Glycerin, Potassium sorbate, Ethanol 70%, Aquades
- c. Stages/Conduct of Research:

Preparation of kepok banana peel powder is done in the following way

- a. Take the kepok banana peel, then cleaned to avoid microbes
- b. Steaming is done for 15 minutes, so that the sap separated
- c. Sharpening is done, 0.5 cm thick cm thick so that it is easy to do disbursement
- d. Drying at 600C for 10 hours, then cooled
- e. Then Flouring or grinding with using a blender
- f. Then sieving with mesh 20
- g. Banana peel powder Based on Siti's reference Khodijah, the journal proportion of banana flour and kaolin on the organoleptic properties of face mask.

Results and Discussions

1. Results

In making a banana peel mask as an alternative treatment for adolescent acne, the results obtained showed that this mask has considerable potential to treat acne, with significant benefits in several important aspects of skincare. Banana peel masks have a number of bioactive ingredients that provide significant benefits in acne skin care, especially for teenagers who often experience this

problem. Banana peels contain various compounds that have anti-inflammatory, antibacterial, and antioxidant properties that play an active role in treating acne. Based on existing research, these compounds are proven to be effective in relieving skin inflammation caused by acne, killing acne-causing bacteria, and accelerating skin regeneration. Banana peel masks are able to reduce the number of pimples and even out skin texture, which is a common problem for teenagers who experience acne.

Banana peel is a natural ingredient that is rich in nutrients and bioactive compounds that are beneficial for skin health. The antioxidant, anti-inflammatory and antibacterial properties of banana peels make them a potential natural solution for acne, especially in teenagers who are prone to this skin problem. Acne in teenagers is generally caused by hormonal changes that trigger excess sebum production, as well as bacterial infections that worsen skin conditions. Therefore, using natural ingredients such as banana peels can be a safer alternative to chemical-based products that often cause side effects such as irritation or dry skin. Banana peels also play a greater role in the wound healing process due to their effectiveness on mucosal defense mechanisms through increased mucosal cell proliferation and DNA synthesis. The addition of large amounts of banana peel to food ingredients can increase antioxidant activity and physicochemical properties. (Afzal et al., 2022). Banana peels contain various bioactive compounds such as lutein, vitamin C, potassium, flavonoids, and saponins that have antioxidant, anti-inflammatory, and antibacterial benefits. Functions include:

a. Lutein

Some of the uses of lutein in health include helping to protect skin from UV radiation, as an ingredient in cosmetics, nutritional supplements for the prevention and treatment of macular degeneration (cataracts), preventing retinal damage caused by blue light by absorbing the light and preventing photooxidation. Various vitamins and minerals contained in banana peel play a role in neutralizing free radicals. (Mahmudah & Winant, 2013). The anti-inflammatory and anti-oxidant effects of lutein are attributed to its unique structure, especially the presence of conjugated double bonds and hydroxyl groups. The conjugated double bond acts as a powerful antioxidant by donating electrons and reacting with free radicals to form more stable products (Zhang et al., 2018). lutein can also help fade acne scars or hyperpigmentation. This is because lutein improves blood circulation and speeds up the skin regeneration process. Skin that regenerates faster can help remove acne scars faster and brighten tarnished skin. Lutein works to rejuvenate the skin and make it look healthier and brighter.

b. Vitamin C

Banana peels have a complete nutritional content, including vitamin C and antioxidants (Nofita et al., 2024). Vitamin C has various benefits including as an antioxidant against pollution, exposure to sun, cigarette smoke, etc.; brightens the skin; delays the effects of aging; and increases collagen formation which makes the skin supple, smooth, and bright. Vitamin C has anti-inflammatory properties that can help reduce inflammation in the skin. By reducing inflammation, vitamin C can reduce the size of acne, speed up the healing process, and prevent acne from becoming more severe. Applying vitamin C to the skin can help soothe inflamed skin caused by acne and reduce inflammatory symptoms such as redness and swelling.

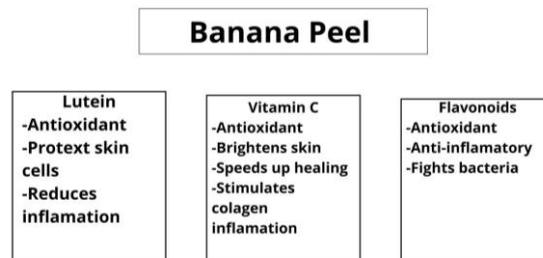
Vitamin C also plays a role in protecting the skin from damage caused by external factors such as pollution, UV rays, and free radicals. Overexposure to UV rays and pollution can worsen acne-prone skin by increasing inflammation and slowing down acne healing. By acting as an antioxidant, vitamin C protects the skin from this damage, reduces the negative impact of free radicals, and helps keep the skin healthy. This protection is essential for preventing new breakouts and for improving overall skin condition. Vitamin C also acts as a skin lightening agent and treats dark spots, as vitamin C can inhibit melanin synthesis. Melanin is the pigment in the skin that

gives it its brownish color. Melanocytes and the enzyme tyrosinase are important elements in the formation of melanin (Lulu et al., 2022).

Vitamin C deficiency results in the loss of a number of important skin functions. In particular, poor wound healing (with regard to collagen formation), thickening of the stratum corneum, and subcutaneous hemorrhage. Collagen is a protein that is essential for maintaining skin suppleness and elasticity. Acne can cause the skin to lose its elasticity, especially if scar tissue formation occurs. Vitamin C boosts collagen production, which helps improve skin texture, prevents acne scars, and keeps skin supple and smooth. By boosting collagen, vitamin C not only treats active acne but also repairs damage caused by past acne (Pullar et al., 2017).

c. Flavonoid

Flavonoids are compounds that have antibacterial, anti-inflammatory, and antioxidant properties. In banana peels, flavonoids can help inhibit the growth of *Propionibacterium acnes*, one of the bacteria that cause acne. By killing acne-causing bacteria, flavonoids play a role in reducing the number of pimples and speeding up the healing process. In addition, flavonoids also have a calming effect on skin that is irritated and red from inflammation. Flavonoids have various biochemical and antioxidant effects that are beneficial and associated with several diseases such as cancer, Alzheimer's disease (AD), atherosclerosis, and others (Ovando et al., 2009). This is because flavonoids have various activities such as antioxidant, anti-inflammatory, antimutagenic, and anticancer properties, along with their capacity to modulate key cellular enzyme functions (Khoirunnisa & Sumiwi, 2019).



Picture 1. Key Bioactive Compounds in Banana Peel for Acne Treatment
Sources: Personal Documentation, 2025

2. Discussions

The findings of this study demonstrate the potential benefits of banana peel extract as an alternative treatment for acne, particularly in adolescents. Through a comprehensive literature review, this research highlights the bioactive compounds present in banana peels that contribute to their effectiveness in acne management. The results indicate that banana peel masks possess antibacterial, anti-inflammatory, and antioxidant properties, making them a viable natural skincare solution. The application of banana peel extract in skincare aligns with the growing trend of utilizing natural ingredients to minimize the adverse effects associated with chemical-based treatments.

a. Bioactive Compounds in Banana Peel and Their Role in Acne Treatment

Banana peels contain several bioactive compounds, including lutein, vitamin C, flavonoids, and saponins, which play a crucial role in maintaining skin health. These compounds exhibit significant antimicrobial and anti-inflammatory properties, which are essential in acne prevention and treatment. Acne, primarily caused by excess sebum production, bacterial infections, and inflammation, can be effectively managed by harnessing the therapeutic potential of banana peel extract.

b. Lutein and Its Role in Skin Protection

Lutein, a carotenoid present in banana peels, contributes significantly to skin protection against oxidative stress and UV radiation. It functions as a potent antioxidant by neutralizing free radicals that contribute to skin aging and acne-related damage (Mahmudah & Winant, 2013). Additionally, lutein enhances skin regeneration, accelerates the healing of acne scars, and improves overall skin texture. Research has demonstrated that lutein absorbs harmful blue light and prevents photooxidation, which may contribute to acne exacerbation (Zhang et al., 2018). The ability of lutein to promote blood circulation and facilitate collagen synthesis further underscores its importance in maintaining healthy and blemish-free skin.

c. Vitamin C and Acne Management

Vitamin C, widely recognized for its antioxidant and skin-brightening properties, plays an integral role in acne treatment. The presence of vitamin C in banana peels enhances collagen production, promotes skin elasticity, and reduces hyperpigmentation caused by acne scars (Nofita et al., 2024). Moreover, its anti-inflammatory effects help mitigate acne-related swelling and redness. By neutralizing free radicals, vitamin C protects the skin from environmental stressors, such as pollution and UV exposure, which are known to aggravate acne conditions (Lulu et al., 2022). The role of vitamin C in inhibiting melanin synthesis is particularly beneficial for individuals suffering from post-inflammatory hyperpigmentation (Pullar et al., 2017).

d. Flavonoids and Antibacterial Activity

Flavonoids present in banana peels exhibit remarkable antibacterial, anti-inflammatory, and antioxidant properties. These compounds effectively inhibit the proliferation of *Propionibacterium acnes*, the primary bacterium responsible for acne formation. By curbing bacterial growth, flavonoids aid in reducing acne severity and accelerating the healing process. Additionally, their ability to modulate inflammatory responses makes them valuable in preventing acne-induced skin irritation and redness (Ovando et al., 2009). The multi-functional nature of flavonoids, including their antioxidant and anticancer potential, underscores their broader therapeutic applications (Khoirunnisa & Sumiwi, 2019).

e. Effectiveness of Banana Peel Masks in Acne Treatment

The results indicate that banana peel masks effectively reduce acne lesions and improve overall skin texture. The anti-inflammatory properties of banana peels help in soothing irritated skin, while their antibacterial activity combats acne-causing microbes. The combined action of lutein, vitamin C, and flavonoids supports skin repair mechanisms, ensuring a reduction in acne severity over time.

Moreover, the hydrating properties of banana peel masks prevent excessive skin dryness, a common side effect of conventional acne treatments. Unlike chemical-based products that may cause irritation, banana peel masks provide a gentle yet effective solution for individuals with sensitive skin. The presence of natural humectants in banana peels aids in maintaining skin moisture balance, thereby preventing excessive sebum production that often leads to acne outbreaks.

f. Comparative Advantage Over Conventional Acne Treatments

Traditional acne treatments, such as benzoyl peroxide and salicylic acid, often cause side effects, including skin dryness, peeling, and irritation. In contrast, banana peel masks offer a safer alternative with minimal adverse effects. The natural composition of banana peels ensures that they do not strip the skin of essential moisture, making them suitable for prolonged use. Additionally, their affordability and accessibility make them an attractive option for individuals seeking cost-effective skincare solutions.

The increasing consumer preference for organic and eco-friendly skincare products further strengthens the relevance of banana peel masks in modern dermatological practices. The use of banana peels aligns with the principles of sustainable beauty, reducing environmental waste while promoting skin health. The repurposing of banana peels for skincare applications underscores the importance of utilizing natural resources efficiently.

g. Limitations and Future Research Directions

While this study provides valuable insights into the potential benefits of banana peel masks for acne treatment, certain limitations must be acknowledged. The findings are based on a literature review, and further empirical studies are required to validate the efficacy of banana peel masks through clinical trials. Additionally, the concentration of bioactive compounds in banana peels may vary based on factors such as banana variety, ripeness, and processing methods. Standardizing the formulation and application techniques of banana peel masks is essential for ensuring consistent results.

Future research should focus on investigating the synergistic effects of banana peel extract in combination with other natural skincare ingredients. Exploring the potential of banana peel derivatives in pharmaceutical formulations for acne treatment could pave the way for innovative dermatological products. Moreover, understanding the long-term effects of banana peel masks on different skin types will provide a comprehensive perspective on their applicability in personalized skincare regimens.

Conclusion

Based on the findings of this study, banana peel masks have significant potential as a natural solution for preventing and treating acne in teenagers. The bioactive compounds present in banana peels, such as lutein, vitamin C, potassium, flavonoids, and tannins, contribute to their antioxidant, anti-inflammatory, and antibacterial properties. These compounds help reduce inflammation, inhibit the growth of acne-causing bacteria, and promote skin regeneration, making banana peel masks an effective and safe alternative to chemical-based acne treatments. Additionally, banana peels provide an eco-friendly and sustainable skincare option, as they utilize organic waste to create a beneficial skincare product. However, further research and clinical validation are needed to optimize the formulation, determine long-term efficacy, and explore the best methods for application. In conclusion, banana peel masks offer a promising, affordable, and sustainable acne treatment for teenagers. With continued research and development, this natural remedy could become a widely accepted alternative to conventional acne treatments, providing both skincare benefits and environmental advantages.

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