



## Utilization of Natural Materials as a Preparation of Acne Face Mask Gel: A Narrative Review

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### ABSTRACT

The current treatment for acne disorders is generally adjusted to the grade of acne, where the use of exfoliating agents to antibiotics is the current choice. This has a serious impact on the health of facial skin, where allergies, irritation, and clogged pores of the facial skin become negative impacts that often occur. Exploration of new modality therapy is a solution to provide the best treatment for facial skin. This literature review aims to discuss the use of natural ingredients such as face masks to treat acne. Some natural plant ingredients that have anti-acne benefits are used as basic ingredients in the formulation of facial gel masks for acne-prone skin, including *Carica papaya L*, *Curcuma zedoaria*, *Citrus sinensis (L) osbeck*, *Nephelium lappaceum L*, and *Leucaena leucocephala*.

### 1. Introduction

Acne is a facial problem that is a concern for everyone. Many feel their self-confidence drops when they have acne on their faces. The current management of acne disorders is generally adjusted to the grade of acne, where the use of exfoliating agents to antibiotics is the current choice. This has a serious impact on the health of facial skin, where allergies, irritation, and clogged pores of the facial skin become negative impacts that often occur.<sup>1,2</sup>

Exploration of new modality therapy is a solution to provide the best treatment for facial skin. Indonesia is a country rich in biological resources. Indonesia is the second-largest country with biodiversity after

Brazil. This biological wealth makes Indonesia has great potential for the development of new therapeutic modalities by utilizing natural ingredients. Every natural ingredient is rich in primary and secondary metabolites, where primary metabolites are used by plants for their survival, and secondary metabolites are usually not used directly by plants for their survival and have the potential to be developed into new therapeutic modalities to treat acne.<sup>3-7,10</sup>

#### The formulation of acne face mask gel preparations

Acne vulgaris, or acne, is a chronic skin disease caused by pilosebaceous disorders, which causes non-inflammatory lesions such as sumuran as inflammatory lesions and varied scars. Acne vulgaris



is a very common condition, with a lifetime prevalence of up to 85%. This condition most often occurs in adolescence and can persist into adulthood. Acne can arise due to several factors, such as epidermal hyperproliferation and follicular blockage, excess sebum production, the activity of commensal bacteria *Cutibacterium acnes*, and inflammation. The clinical manifestations of acne can be non-inflammatory (such as open or closed comedones) and inflammatory lesions such as papules, pustules, and nodules. Acne usually appears on skin that has many sebaceous follicles, such as the face, chest, and back. Acne can cause local symptoms such as pain or redness but generally does not cause systemic symptoms.<sup>3,7</sup>

Quite a lot of Indonesian plants that have the potential as antioxidants and skin moisturizers can be utilized in the form of peel-off gel masks. The preparation of a peel-off gel mask is very practical to

use. After the mask dries, it can be cleaned by removing the gel layer from the skin without rinsing it with water so that it will be easier for consumers to use. The physical quality of the peel-off gel mask is influenced by the composition of the ingredients added to the formulation. The two main components used to make peel-off gel masks are film-forming and humectants. In-gel formulation, film-forming components are critical factors that can affect the physical properties of the resulting gel. In addition, humectants also play an important role in gel preparations because humectants function to maintain the stability of the preparation by absorbing moisture from the environment and reducing the evaporation of water from the preparation.<sup>3-8</sup> Table 1 shows the potential of several Indonesian plants that have the potential to be developed as new modality therapy in dealing with acne problems.

Table 1. Preparation of acne facial mask gel

Plants	Compound content	Test method on bacteria
Papaya leaf ( <i>Carica papaya L</i> ) <sup>8,11</sup>	Enzymes papain, alkaloids, pseudokapain, glycosides, carposids, and saponins	Sumuran
Temu putih ( <i>Curcuma zedoaria</i> ) <sup>2,4,6</sup>	Flavonoids, tannins, and saponins	Agar diffusion
Sweet orange peel ( <i>Citrus sinensis (L) Osbeck</i> ) <sup>1</sup>	Flavonoids and terpenoids	Sumuran agar
Rambutan leaf ( <i>Nephelium lappaceum L</i> ) <sup>9</sup>	Alcolloids, flavonoids, tannins, and saponins	Sumuran
Petai Cina leaf ( <i>Leucaena leucocephala</i> ) <sup>5</sup>	Alcolloids, saponins, flavonoids, tannins, protein, fat, calcium, phosphorus, iron, and vitamins (A, B, C).	Sumuran

### Papaya leaf (*Carica papaya L.*)

Papaya leaf (*Carica papaya L.*) was made into simplicia and made into ethanol extract by maceration. The test bacteria were pure strains of *Escherichia coli* and *Staphylococcus aureus*. Papaya leaf extract inhibited the growth of *Staphylococcus aureus* at concentrations ranging from 30% to 100%, with an average area diameter ranging from 7.9 mm to 13.2 mm. The formation of a zone of inhibition of bacterial growth indicates that papaya leaf extract has

active antibacterial compounds. The active compounds in papaya leaves that inhibit bacterial growth are tocopherols and karpan alkaloids.<sup>8,11</sup>

### Temu putih (*Curcuma zedoaria*)

Temu Putih (*Curcuma zedoaria*) is a natural plant that contains secondary metabolites that inhibit bacterial growth, namely flavonoids, tannins, and saponins. The extract of temu putih rhizome shows strong inhibitory power to be very strong against acne-



causing bacteria, *Staphylococcus aureus*. essential oil (*Curcuma zedoaria*) can inhibit *Staphylococcus epidermidis*.<sup>2,4,6</sup>

#### **Sweet orange peel (*Citrus sinensis* (L) Osbeck)**

Activity test using the Sumur method antibacterial activity test was designed to determine the inhibition zone of sweet orange peel extract (*Citrus sinensis* (L) Osbeck) against *Staphylococcus aureus*. The ethanol extract stock solution was prepared by dissolving sweet orange peel ethanol extract. The results of the inhibition zone of sweet orange peel ethanol extract against *Staphylococcus aureus* showed that an effective concentration of 10% had an inhibitory effect on bacterial growth.<sup>1</sup>

#### **Rambutan leaf (*Nephelium lappaceum* L)**

Antibacterial activity test against *Propionibacterium acnes* was carried out using the Sumur method. Changes in the concentration of rambutan leaf extract in the formulation of a 70% ethanol extract peel-off gel mask which has activity against *Propionibacterium acnes*. The antibacterial test results of the peel-off gel mask formulation showed that rambutan leaves (*Nephellium lappaceum* L.) contain alkaloids, flavonoids, tannins, and saponins that have antibacterial activity against *P. acnes*. The mechanism of action of alkaloids has the ability to inhibit bacterial growth.<sup>9</sup>

#### **Petai Cina leaf (*Leucaena leucocephala*)**

The antibacterial activity test against *Staphylococcus aureus* was carried out by the Sumur method. In the skin gel formulation, 5% extract concentration inhibited the growth of *Staphylococcus aureus*. The formation of a transparent area around the sumuran is due to the presence of active substances from the petai cina leaf extract, namely tannins, flavonoids, saponins, and lupeol compounds. The compound lupeol is a terpenoid in the pentacyclic triterpenoids. A polymer is strong enough to damage the porin. Porins, which act as entry and exit points for compounds, reduce the permeability of the sumuran cell because it has been disturbed. In this

way, the bacterial cell is deprived of nutrients, resulting in inhibited bacterial growth or death.<sup>5</sup>

## **2. Conclusion**

Some natural plant ingredients that have anti-acne benefits are used as basic ingredients in the formulation of facial gel masks for acne-prone skin, including *Carica Papaya* L, *Curcuma Zedoaria*, *Citrus Sinesis* (L) Osbeck, *Nephelium Lappaceum* L, *Leucaena Leucocephala*.

## **3. References**

1. Ariani LW, Wigati D. Formulation of peel-off gel mask ethanol extract of sweet orange (*Citrus sinensis* (L.) osbeck) peel as an acne medication. Media Farmasi Indonesia. 2016; 11(2): 87-93.
2. Busman E, Wirahmi SD. Inhibitory power of temu putih rhizome extract (*Curcuma zedoaria*) against *Streptococcus mutans* and *Staphylococcus aureus*. J LPPM UMSB. 2019; 12(6): 19-28.
3. Fauzi AR, Nurmalina R. Caring for the skin and face. PT Elex Media Komputindo: Jakarta. 2012.
4. Kartika SD, Suci PR, Safitri CINH, Kumalasari ND. The formulation of the peel-off gel mask preparation of temu putih extract (*Curcuma zedoaria*) as an anti-acne. Prosiding SNPBS (Seminar Nasional Pendidikan Biologi dan Saintek). 2021; 351-8.
5. Khasanah RM. Peel-off gel mask formulation of ethanol extract of petai cina leaves (*Leucaena leucocephala*) as an antibacterial anti-acne. IJMS-Indo J Med Sci. 2021; 7(1): 97-105.
6. Maiyani H, Nurlaila N, Irmanida B. Potential of temu putih (*Curcuma zedoaria*) as antibacterial and chemical compounds. Institut Pertanian Bogor: Bogor. 2011.
7. Meilina N, Hasanah A. Antimicrobial activity of mangosteen peel extract (*Garnicia mangostan* L) against acne-causing bacteria.



Fakultas Farmasi Universitas Padjajaran:  
Bandung. 2018.

8. Pratiwi I, Rusita YD. Papaya leaf extract mask formulation (*Carica papaya L.*) as an anti-acne. *J Kebidanan Kesehatan Tradisional*. 2018; 3(2): 84-9.
9. Putri R, Supriyanta J, Adhil DA. Formulation and activity test of the peel-off gel mask preparation of 70% ethanol extract of rambutan leaves (*Nephelium lappaceum L.*) against *Propionibacterium acnes*. *J Pharmaceutical Health Res*. 2021; 2(1): 12-20.
10. Sreedevi R. Phytochemical and antibacterial activities of *Santalum album*. *Int J Pharm Sci Rev Res*. 2015; 33(1): 280-3.
11. Tuntun M. Effectiveness test of papaya leaf extract (*Carica papaya L.*) against the growth of *Escherichia coli* and *Staphylococcus aureus*. *J Kesehatan*. 2016; 7(3): 497-502.

