Avocado Gel: Herbal Solution for Skin Nourishment

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Abstract- Psoriasis is a persistent autoimmune skin disorder marked by excessive keratinocyte proliferation, chronic inflammation, and noticeable scaling, often resulting in both physical discomfort and emotional distress. Although conventional synthetic therapies exist, their prolonged use is frequently associated with adverse side effects. To offer a safer and more holistic alternative, this project focuses on formulating a 30 g herbal gel using naturally derived, skin-friendly ingredients aimed at alleviating psoriasis symptoms. The formulation includes avocado pulp, known for its rich content of essential fatty acids and vitamins that support skin regeneration; aloe vera gel for its renowned anti-inflammatory and soothing effects; sweet almond oil to deeply moisturize and aid in skin repair; vitamin E as a protective antioxidant; and glycerin to maintain optimal skin hydration. Xanthan gum was employed as the gelling agent due to its biocompatibility and formulation stability. The gel underwent comprehensive evaluation, including assessments of appearance, color, odor, consistency, pH, viscosity, spreadability, washability, and skin irritation to confirm its safety and therapeutic potential. Each ingredient was selected not only for its individual benefits but also for its synergistic action in reducing inflammation, strengthening the skin barrier, and supporting tissue healing. The final product displayed desirable physical attributes and was proven to be non-irritating upon topical application. This herbal gel offers a promising natural treatment strategy for managing psoriasis, enhancing patient adherence through topical use, reducing dependency on conventional drugs, and encouraging the integration of plant-based therapies into long-term dermatological care.

Keywords: Avocado Gel, Herbal Solution For Skin.

INTRODUCTION

The skin, as the largest organ of the human body, serves as a vital protective shield against external threats such as pollutants, pathogens, and environmental stressors. Due to its constant exposure, it is particularly vulnerable to a range of conditions, including infections, allergic reactions, inflammatory disorders, and chronic diseases. Among these, psoriasis stands out as a prevalent and challenging chronic inflammatory skin disorder. It is an autoimmune condition marked by accelerated keratinocyte turnover, resulting in thick, scaly, inflamed patches of skin that are often itchy, red, and uncomfortable. Psoriasis can manifest on various parts of the body and significantly diminish an individual's quality of life. Genetic predisposition, combined with environmental triggers such as stress, infections, or skin trauma, is thought to contribute to its onset. Conventional treatment strategies—ranging from corticosteroids and immunosuppressants to other topical agents—can be effective but often carry the risk of adverse effects, especially with prolonged use. As a result, there is growing interest in herbal-based alternatives due to their gentler, safer, and more sustainable therapeutic profiles. Among the various dosage forms, herbal gels offer distinct advantages: they are easy to apply, enhance patient compliance, enable rapid skin absorption, and accommodate both hydrophilic and lipophilic herbal constituents. These topical formulations allow targeted treatment at the site of inflammation while minimizing systemic exposure and associated side effects. In this context, the current project centers on the formulation of a 30 g herbal gel designed specifically to manage psoriasis symptoms. The formulation integrates key natural ingredients known for their skin-repairing properties: Avocado oil, rich in nourishing fatty acids; Aloe vera gel, a renowned anti-inflammatory and soothing agent; Glycerin, a powerful humectant that maintains skin hydration; Vitamin E, which acts as an antioxidant to protect and repair skin cells; and Acacia powder, used as the gelling agent for its natural origin and skin-friendly properties. Together, these ingredients aim to offer a multi-functional, plant-based gel that supports skin healing, reduces inflammation, and promotes comfort for individuals living with psoriasis.

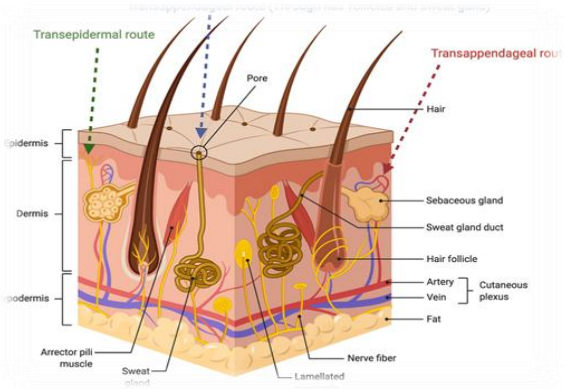

Fig: Transdermal Route

Skin Absorption & Relief Action

Skin is a delicate organ made up of multiple layers, primarily the epidermis, dermis, and hypodermis. Our herbal gel is designed to be absorbed mainly into the epidermis and upper dermis, where it delivers moisture, cools the skin, and reduces irritation. While it doesn't cure psoriasis, it provides relief-based care, helping soothe dryness, rashes, and inflammation. There are various types of skin conditions such as excessive dryness, xeroderma, and mild psoriasis. As shown in below figures. These issues can cause discomfort and irritation. Using Gel can help soothe the skin and provide effective relief. It supports skin hydration and promotes healing.

Fig : 1& 2 Psoriasis

Active Constituent Used In Gel :

1) AVOCADO:

FIG :- 1- AVOCADO

Avocado, scientifically known as *Persea americana* and a member of the Lauraceae family, is a tropical and subtropical fruit originally native to Central America and Mexico. Due to its exceptional nutritional profile and wide-ranging benefits, it is now cultivated globally and utilized in various sectors including food, medicine, and cosmetics. In the realm of skincare, avocado has recently gained significant attention for its rich composition of bioactive compounds that contribute to numerous skin health benefits.

Botanical Profile

- Scientific Name: *Persea americana*
- Family: Lauraceae
- Common Name: Avocado

Phytochemical Constituents

Avocado is a powerhouse of biologically active compounds that support skin health through various mechanisms. Its key constituents include:

- Fatty Acids: Oleic acid, linoleic acid, palmitic acid
- Vitamins: A, C, D, E, and K
- Carotenoids: Lutein, zeaxanthin
- Phytosterols: Beta-sitosterol
- Polyphenols and Flavonoids
- Other Lipids: Squalene, Lecithin

These components collectively enhance the therapeutic profile of avocado, making it ideal for topical skincare applications.

Pharmacological Actions on Skin

Avocado and its oil exhibit a wide spectrum of skin-beneficial pharmacological properties:

- Deep Moisturization: The abundance of oleic acid and lecithin supports long-lasting hydration and helps strengthen the skin's natural barrier.
- Antioxidant Protection: Rich in vitamins E and C, along with polyphenolic compounds, avocado helps neutralize free radicals, thereby delaying signs of aging.
- Anti-inflammatory Action: Avocado oil soothes inflamed and irritated skin, proving useful in managing chronic inflammatory skin conditions such as eczema and psoriasis.
- Enhanced Wound Healing: It promotes collagen production and supports faster regeneration of damaged skin tissues

2)Aloe vera

FIG :- 2 -ALOE VERA

Aloe vera, botanically identified as *Aloe barbadensis Miller*, is a succulent, perennial plant known for its thick, fleshy, pea-green leaves. Belonging to the Asphodelaceae (formerly Liliaceae) family, it thrives in arid climates due to its xerophytic nature. Aloe vera has a long-standing reputation in traditional and modern medicine, particularly in dermatology, owing to its rich composition of therapeutic compounds.

Phytochemical Constituents of Aloe Vera

Aloe vera contains a diverse array of bioactive compounds that contribute to its extensive medicinal properties, especially for skin care:

- Anthraquinones:
  The plant yields around 12 anthraquinone derivatives—phenolic compounds historically used for their laxative effects. Among them, aloin and emodin are notable for their analgesic, antibacterial, and antiviral properties.
- Plant Sterols and Fatty Acids:
  Aloe vera provides four key plant steroids: cholesterol, campesterol, β-sitosterol, and lupeol. These compounds exhibit strong anti-inflammatory effects, while lupeol also functions as an antiseptic and analgesic agent.

Pharmacological Actions on Skin

Aloe vera has demonstrated significant dermatological benefits, supported by both traditional use and scientific research:

1. Protection Against Radiation Damage:
   Aloe vera gel helps shield the skin from damage caused by UV and gamma radiation. Although the precise mechanism remains under investigation, studies suggest that its application promotes the synthesis of metallothionein, an antioxidant protein. This protein neutralizes hydroxyl radicals and helps maintain the activity of key antioxidant enzymes like superoxide dismutase and glutathione peroxidase, which are otherwise suppressed during radiation exposure.
2. Anti-inflammatory Properties:
   Aloe vera inhibits the cyclooxygenase (COX) pathway, thereby reducing the production of prostaglandin E2 from arachidonic acid—a major driver of inflammation. Recent research has also identified a novel compound in the gel, C-glucosyl chromone, which contributes to its potent anti-inflammatory effects.

3) Sweet Almond Oil:

FIG:- 3 -Sweet Almond Oil

Botanical Profile:

Botanical Name: Prunus amygdalus var. dulcis(Also known as Prunus dulcis)

Family: Rosaceae

Common Names:Sweet Almond, Badam (Hindi), Mandl (Sanskrit)

constituent	category	funtion
Oleic Acid (Omega-9)	Fatty Acid	Moisturizes Skin
Linoleic (Acid Omega -6)	Polyumsaturated Fatty Acid	Reduced dryness and flakiness
Palmitic Acid	Saturated Fatty Acid	Emollient, Forms Protective Barrier
Vitamin A	Fat -Soluble Vitamin	Protect skin from Regeneration, reduce scaling
Protein and Amino Acid	Nutrients	Aid in skin repair,skin structure
Vitamin K	Fat – Soluble vitamin	Assists in Wound , reduce redness
Polyphenols and Flavonoids	Antixidants	Reduce infflamation

Phytoconstituents:
1. Fatty Acids:
Oleic acid (Omega-9) – ~60–80%
Linoleic acid (Omega-6) – ~15–30%
Palmitic acid – ~5–10%
Stearic acid – trace amount
2. Vitamin Vitamin A, Small amounts of Vitamin D and B-complex
3. Phytosterols : Beta-sitosterol, Campesterol ,Stigmasterol
4. Polyphenols & Flavonoids:Catechins and other antioxidants (present in minor amounts)
Pharmacological Activities:

1.Emollient
2.Anti-inflammatory
3.Antioxidant
4.Wound healing
5.Moisturizing agent
Uses in Herbal Formulations:
1.Base oil in ointments, creams, gels
2.Carrier oil for essential oils
3.Used in cosmetic products for skin softening and nourishment
4 .Helps improve skin texture and reduce inflammation

Sr. No.	Ingredients	Quantity	Roles
1	Avocado Pulp	6 g	Active ingredient , soothing ,Moisturizing and skin repair
2	Aloe Vera Gel	15g	Base gel-Healing ,hydration,Antiinfflamatory
3.	Xanthan gum	0.6g	Gelling agent – provides gel Structure
4.	Glycerol	0.9g	Humectant -Retains moisture
5.	Vitamin E capsule (Tocopherol)	0.3g	Antioxidant-Skin Protection and Healing
6.	Distilled water	6.9ml	lSolvent – Adjusts volume and cosistency

Preparation of Herbal Gel – 30 g Batch:
Of course!
Here's your procedure shown vertically with arrows for each step:
1 Gel Base Formation
↓
Dissolve 0.6 g xanthan/guar gum
↓
Gradually add 11.4 g distilled water with continuous stirring
↓
Add 0.9 g glycerin
↓
Stir until gel is hydrated and uniform

2 Addition of Active Ingredients
↓
Add 15 g aloe vera gel to hydrated base
↓
Add 1.5 g sweet almond oil
↓
Add 0.3 g Vitamin E oil
↓
Add 5 g avocado pulp
↓
Blend all ingredients slowly until homogenous

3 Preservation and Packaging
↓
Add 0.3 g sodium benzoate (optional)
↓
Stir the final mixture uniformly
↓
Transfer to clean, sterilized container
↓
Store in refrigerator (recommended)

Evaluation Tests for Avocado Pulp-Based Gel (Therapeutic Use in Psoriasis):

1. Physical Appearance

Objective: Check for color, odor, consistency, and homogeneity.

Significance: Ensures patient acceptability and uniform dispersion of avocado pulp.

2. pH Determination

Method: Use a digital pH meter or pH paper.

Acceptable Range: 5.5–6.5 (skin-friendly).

Significance: Maintains skin barrier integrity and avoids irritation.

3. Viscosity Test

Instrument: Brookfield Viscometer .

Significance: Measures gel spreadability and consistency; xanthan-based gels are shear-thinning.

4. Spreadability Test:

Method: Place 1g gel between two slides, apply weight (500g), measure the diameter of spread.

Significance: Ensures easy application on psoriatic plaques.Washability Test

Method: Apply to skin or a surface and try washing with water.

5.Skin Irritation Test (Patch Test):

Subject: On forearm or back of a healthy volunteer (under supervision).

Time: Leave for 24 hours, observe for redness, itching, or swelling.

Significance: Ensures gel is safe for psoriatic or sensitive skin.

6.Stability Studies (Short-term)

Method: Store gel at different temperatures (room temp, 4°C, 40°C) for 7–14 days.

Observation: Check for phase separation, color change, or microbial growth.

Significance: Confirms short-term physical stability.

7.Antioxidant Activity (Optional, if lab allows) Test: DPPH assay (spectrophotometric method)

Purpose: Measures free radical scavenging ability of avocado pulp and Vitamin E.

Significance: Supports therapeutic antioxidant claim.

CONCLUSION

The present project aimed to develop a herbal gel formulation using avocado pulp/oil, aloe vera gel, sweet almond oil, and other skin-beneficial ingredients. The formulation was designed to target skin conditions such as psoriasis, leveraging the therapeutic potential of natural actives. Avocado, rich in essential fatty acids, vitamins, antioxidants, and phytosterols, plays a significant role in moisturizing, soothing inflammation, and enhancing skin repair. The final gel was successfully prepared using a simple cold blending technique suitable for lab-scale formulation. The ingredients were selected based on their compatibility, skin benefits, and availability. The formulation showed good consistency, pH compatibility with skin, and ease of applicationThis project highlights the potential of combining herbal ingredients for safe and effective skincare solutions, promoting the use of natural remedies in dermal therapeutics. Further evaluation and optimization can lead to its commercial applicability for treating psoriasis and other skin ailments.

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