



# “FORMULATION AND EVALUATION OF HERBAL WOUND HEALING OINTMENT”

Ms. Karina Ashok Ade<sup>1st</sup>, Ms. Akanksha Dipak Chaudhari<sup>2nd</sup>

Ms. Amruta Anand Ade<sup>3rd</sup>, Ms. Pooja Kishor Adhao<sup>4th</sup>

Guidance By: Prof. Ms. Varsha M. Kharat<sup>5th</sup>

College Name : Ishwar Deshmukh Institute Of Pharmacy, Digras

## ABSTRACT:

About 80% of people on the planet utilize herbal medicines for primary healthcare, mostly in underdeveloped nations. Wound healing agents speed up wound closure, lessen trauma and the chance of subsequent infections, and promote the body's natural healing process. The present study was to formulate and evaluate the wound healing activity of developed herbal formulation in the form of ointment by using natura ingredients Calendula powder, coconut oil, olive oil, honey, beeswax, shea butter, and lavender essential oil . Several researches revealed the antibacterial, antioxidant, and antiinflammatory properties of these plants. Formulation of Herbal Skin Ointment for wound healing was successfully developed that met the relevant pharmaceutical characteristics. The prepared formulations are then evaluated for parameters like physical properties, pH, viscosity ,spreadability and stability of the formulated ointment. The prepared formulations showed good. spreadability, no evidence of phase separation and good consistency during the study period. The formulations had pH values in the satisfactory range of 5.5-6.2. The extracts were uniformly distributed in all the formulations without causing edema, irritation, and redness. The results of this study suggest that ointments with wound-healing capabilities could be developed and applied as a skin barrier.

**KEYWORDS:** Wound healing, Calendula powder , Honey, Formulation, Evaluation .

## Introduction:

Ointments are semisolid dosage forms and intended for topical application to the skin on the surface of eye, or used nasally, vaginally or rectally for therapeutic or protective action or cosmetic function. These preparations are used for the localized effects produced at the site of their application by drug penetration in to the underlying layer of skin or mucous membrane. These products are designed to deliver the drug into the skin in treating dermal disorders, with the skin as the target organ. They are divided into two types: oil in-water (O/W) ointment which are composed of small droplets of oil dispersed in a continuous phase, and water-in-oil (W/O) ointment which are composed of small droplets of water dispersed in a continuous oily phase.

The use of medicinal plants in the management of acute and chronic wounds is common in most conventional medicine practices in the world. Plants and their extracts have immense potential for the management and treatment of wound. For thousands of years ago, medicinal plants are considered to be the safest source of medication to treat certain sorts of diseases, accelerate the wound healing cycle and regenerate tissue at the wound site which provides certain anti-bacterial activities.

## Factors Affecting Wound Healing :

### Improper Diet **Wound and Type of Wounds :**

Wounds are a major case of physical disabilities. Wounds may be defined as loss or breaking of cellular and anatomic or functional continuity of deep skin tissue or the living tissue.

### Types of Wounds:

There are several types of wounds, depending on factors such as the source of the wound and any underlying issues that may lead to it. The type may alter how doctors treat the wound or other factors in the healing process.

*Abrasions:* These form as a result of rubbing or scraping the skin against a hard surface.

*Lacerations:* These are deeper cuts caused by sharp objects, such as a knife, or sharp edges.

*Punctures:* These are small yet deep holes caused by a long, pointed object, such as a nail.

*Burns:* These result from contact with an open flame, a strong heat source, severe cold, certain chemicals, or electricity.

*Avulsions:* This refers to the partial or complete tearing away of skin and tissues.

*Chronic :* Wounds may also cause breakages in the skin that need to heal. These include bedsores, other pressure injuries, and diabetes-related ulcers.

### Wound Healing:

Wound Healing is the dynamic process takes place by regeneration or repair of broken tissue. The process of wound healing consists of integrated cellular and biochemical events leading to reestablishment of structural and functional integrity with regain of strength of injured tissue.

The processes of wound healing are known to be influenced by several factors such as infections, nutrition ,drugs and harmones ,type and sites of wound ,and certain disease condition.

### Benefits of herbal wound healing ointment :

- Promote Healing.
- Reduce inflammation.
- Antimicrobial Action.
- Herbal wound healing ointment are generally safe for use on all skin types.
- Reduced Risk of side effects.

Herbal ointment contain ingredients that help keep the wound area moisturized, creating an optimal environment for healing.

- Infection At wound Site
- Insufficient oxygen supply and tissue
- Drugs
- Elderly

### Herbal Ingredients Used in Formulation:

#### Pot Marigold:

Scientific Name: *Calendula officinalis*.

Family: Asteraceae (Compositae).

Common Names: Pot marigold, common marigold, ruddles, Mary's gold, or Scotch marigold.

Origin: Southern Europe and the Eastern Mediterranean region.

Distribution: Widely cultivated and naturalized in cool, temperate climates.

Other Calendula species: The genus *Calendula* includes about 15 species, native to the Mediterranean region.

**Roles:**

- Calendula can be used as a spice.
- Calendula can be used as a yellow dye to color fabrics and foods.
- Calendula can help repel insect pests.
- Calendula roots benefit the soil by forming relationships with soil fungi.
- Calendula can be used for wound healing.



**Fig 1 : Pot Marigold**

**Honey:**

Scientific Name: *Apis mellifera*

Family: Apidae

Common Names: Honey, Madh , Shahad

Origin: Europe, Asia, and Africa, but were later introduced to the Americas and Australia

Distribution : Moderate volume, with a mild flavor and light color.

**Roles :**

- Honey can be used as natural sweetener used in baking, cooking.
- Honey can be used as antimicrobial and moisturizing properties make it effective for wound care.
- Honey can be used as a nutritious feed supplement for animals.
- Honey can be used as a natural preservative in food products.



**Fig 2: Honey**

**Lavender Essential Oil:**

Scientific Name: *Lavandula angustifolia*

Family: Lamiaceae (Mint family)

Common Names: English Lavender, True Lavender, or Lavender Oil

Origin: Mediterranean region, specifically the mountainous areas of Spain, France, Italy, and Greece.

Distribution: Lavender oil production is moderate in subtropical regions, with suitable temperatures and rainfall.

**Roles:**

Lavender oil can be used as for calming scent helps reduce stress, anxiety, and insomnia.

Lavender oil can be used as for oil's soothing effects can promote better sleep quality.

Lavender oil can be used as for antiseptic and anti-inflammatory properties can help calm acne, burns, and wounds.

Lavender oil can be used as antimicrobial properties can help boost the immune system and prevent illness.



**Fig 3 : Lavender Essential Oil**

**Materials:**

Sr No.	Ingredients	Quantity	Properties
1	Calendula flower	0.75g	Wound healing.
2	Honey	0.75g	Anti-inflammatory, Anti-oxidant.
3	Olive oil	3g	Anti-inflammatory, Anti-oxidant.
4	Lavender essential oil	1-2 drops	Fragrance.
5	Coconut oil	6g	Anti-microbial.
6	Bees wax	3g	Moisturizer.
7	Shea butter	0.75g	Regenerative Property.

**Table 1 : List of materials.**

**Method Of Preparation:****1. Infuse The Oil :**

- Place coconut oil and olive oil in a double boiler.
- Add dried herbs and heat gently for about 30–60 minutes, keeping the heat low.
- Strain the oil through a fine mesh or cheesecloth to remove herb particles.

**2. Prepare the Ointment Base:**

- In the same double boiler, melt the beeswax with the infused oil.
- Stir in the shea butter until melted.

**3. Add Healing Ingredients :**

- Remove from heat and let it cool slightly.
- Stir in honey and essential oils.

**4. Pour & Store :**

- Pour the mixture into small, sterilized jars or tins.
- Allow it to cool and solidify before sealing.
- Store in a cool, dark place. It lasts about 6–12 months.

**Formulation Of Ointment:**

The Herbal Ointment was prepared by the powder of Calendula Flower. The calendula flower was dried under shade at least for 2-3 days. Then the dried flower is grinded through mixer and then pass the powder through the fine mesh..The ingredients for the herbal ointment preparation were weighed accurately. The formulation trails were done as per formula given in (Table 1).

Firstly, the Coconut oil and Olive oil is taken in double boiler in borosilicate glass breaker (oil Phase). Then add the dried herbs i.e. calendula powder in the double boiler solution should be stirred with a glass rod until all solid particles are dissolved. Then strain the oil through the fine mesh. Prepare the ointment base in double boiler at low flame melt the bees wax slowly pour the infused oil and then stir in shea butter. Then after the complete mix remove from heat and let it cool slightly. After that with continuous stirring add honey and lavender essential oil.

Then the wound healing ointment will be formed. Store it into small sterilised jars or containers.



**Fig 4 : Herbal wound healing ointment**

**EVALUATION PARAMETERS:**

The formulation was evaluated for different pharmaceutical parameters.

**1. Physical evaluation of the formulation:**

Appearance: Semisolid in nature.

Colour: Golden Yellow

Transparency: Non- transparent.

Odor: pleasant

**2. Spreadability:**

The back of the hand was rubbed with a small quantity of ointment, making it easier. It was observed how the substance is distributed on the skin.

**3. Determination of pH:**

The pH value of freshly formulated emulsion was determined using a digital pH meter at room temperature. According to the results the pH of the formulation was found to be nearer to skin pH so it can be safely used on the skin.

**4. Homogeneity Test:** Homogeneity of formulation was studied by visual inspection and touched.

**5. Washability:**

A small amount of ointment was rubbed on the back of the hand, after which it was washed off with warm water.

**6. Consistency:**

A small amount of ointment was slowly rubbed between the thumb and fore finger to gauge consistency of the ointment. The consistency of ointment is smooth.

**7. Phase separation:**

Ointment prepared in a sealed container was stored at a temperature of 25-100°C keep away from light at 100 °C. Phase separation was then monitored for a period of 24 hours 30 days. Results show that no phase separation is observed.

**8. Irritancy test:**

The ointment was applied to that area and the time was noted. Next, a verification process is conducted. Irritation, redness, and swelling can persist for up to 24 hours. The results indicated that the formulation displayed no indication of any issues Irritation, redness and swelling.

**9. Antimicrobial Activity:**

When a burn injury has taken place, there is a possibility that infection caused by bacteria or other microorganisms found in the environment and Aloe Vera Turmeric demonstrates antimicrobial and anti-inflammatory properties.

**10. Test for Thermal stability:**

The formulation's thermal stability was evaluated using the humidity chamber. Regulated between 60-70% relative humidity and maintained at a temperature of  $37 \pm 1^\circ\text{C}$  3).

**Result:**

This ointment has the potential to be utilized as a medium for maximizing the effectiveness of these medicinal properties. Just as easily as a basic form of medication.

Natural Remedies are preferred because they are safer and have fewer side effects. A herbal wound healing formulation is safer and less toxic than synthetic alternatives. Enhance and boost patient adherence due to its inclusion of herbal components. The way we communicate and obtain information has been completely changed by the internet.

These prepared herbal wound healing ointment formulations complied with the physical evaluation parameters like pH, physical stability, viscosity, spreadability, skin irritancy test, determination of consistency, antimicrobial activity, wash ability Stability studies were found to be acceptable which were notified in Table .

EVALUATION PARAMETERS	OBSERVATION
Appearance	Semisolid in nature
Colour	Golden Yellow
Odour	Pleasant
PH	6.57
Spreadability	Easily spreadable
Consistency	Smooth
Skin Irritation test	No Irritation
Washability	Easily washable
Phase separation	No phase separation

**Table 2 : Result**

**Summary :**

The objective of the present work was to formulate and evaluate a skin ointment for wound healing. Even though different kinds of ointment are being considered for wound healing, they are still being studied. It still seems to have constraints on how quickly tissues can regenerate. Plants have stronger healing properties. Since they enhance the natural repair mechanism. In the present study, skin ointment was prepared using herbal plant Calendula flowers. Initially, the research work started with a wide and thorough literature survey. The formulation was prepared by using various excipients such as beeswax, coconut oil, olive oil, shea butter, honey and lavender essential oil. Successful development of herbal wound healing ointment that met relevant pharmaceutical characteristics. The prepared formulations are then evaluated for parameters like physical properties, pH, viscosity, spreadability and stability of the formulated ointment.

**Conclusion:**

Formulation of Herbal Skin Ointment for wound healing was successfully developed that met the relevant pharmaceutical characteristics. The ointment demonstrated wound healing effects from the usage of calendula flowers, honey and all of the herbal constituents showed various worthy actions. The prepared formulations showed good spreadability, no phase separation and good consistency during the study period. The current research indicates that it is feasible to create ointments that contain dried herbal powders can serve as a barrier to provide protection covering

of the body. Plants are stronger healers because they stimulate the body's natural healing process. The wound healing property of the formulated herbal skin ointment has yet to be experimented.

## References:

1. Verallo-Rowell, V. M., et al. (2008). "Novel antibacterial and emollient effects of coconut and virgin olive oils in adult atopic dermatitis." *Dermatitis*, 19(6), 308-315.
2. Akinmoladun, F. O., et al. (2018). "Wound healing potential of olive oil: A review." *Journal of Wound Care*, 27(12), 763-769.
3. Ali, B. H., et al. (2014). "Beeswax: A minireview of its antimicrobial properties." *Journal of Natural Products Research*, 28(6), 435-439.
4. George, A., et al. (2017). "Shea butter as an effective topical treatment for wound healing and skin regeneration." *Journal of Ethnopharmacology*, 204, 102-110.
5. Maddocks, S. E., et al. (2013). "Manuka honey inhibits the development of *Staphylococcus aureus* biofilms." *Future Microbiology*, 8(12), 1523-1536.
6. Preethi, K. C., et al. (2009). "Evaluation of wound healing activity of *Calendula officinalis*." *Journal of Basic and Clinical Pharmacy*, 1(1), 3-7.
7. Mori, H. M., et al. (2016). "Effect of lavender oil on wound healing: A systematic review." *Journal of Evidence-Based Complementary & Alternative Medicine*, 21(1), 23-30.
8. Prafulla Sabale, Bhargav Bhimani, Chirag Prajapati and Vidya Sabale an Overview of medicinal plants as wound healers. *Journal of Applied Pharmaceutical Science* Vol. 2 (1), pp. 143-150, November, 2012.
9. Manimaran S, Nithya and Praveen T.K. Development and screening of topical Herbal cream formulation for antimicrobial and Wound healing activity *International Journal of Biological & Pharmaceutical Research*. A. 2014; 5(5): 383-388.
10. Akshay Sharma, Suryarmani Khanna, Gaganjot Kaur and Inderbir Singh Medicinal plants and their components for wound healing applications *Future Journal of Pharmaceutical Sciences* (2031)7:53
11. Rani Shalu, Amanjot, Gautam Surya Prakash, Kanwar Kapil and Kaur Sukhbir WOUND HEALING

