

# Preparation and Evaluation of Mouth Antiulcer Cream

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**Abstract:** The current research is centered on the development and assessment of an antiulcer cream to be applied topically for the relief of gastric ulcer-associated pain, like abdominal discomfort or dermatitis related to topical drug use in ulcer patients. The cream was formulated from herbal and/or synthetic active compounds that have gastroprotective, anti-inflammatory, and wound-healing activities. The cream was formulated with an appropriate base to provide adequate consistency, spreadability, and stability. Several evaluation parameters like pH, viscosity, spreadability, drug content, and in-vitro drug release were evaluated to establish the quality and effectiveness of the cream. Findings revealed that the formulated cream complied with the required pharmaceutical standards and exhibited potential in offering symptomatic relief. Additional studies could be necessary to determine in-vivo efficacy and safety for clinical application..

**Keywords:** gastroprotective

## I. INTRODUCTION

Mouth ulcers, are a prevalent gastrointestinal disease resulting from an imbalance between harmful factors such as gastric acid and pepsin and the protective system of the gastric mucosa. Conventional management entails the administration of oral drugs such as proton pump inhibitors, H<sub>2</sub> blockers, and antacids. These, however, if taken for extended periods, can result in side effects and drug resistance, and hence other therapeutic options have been sought.

Topical preparations like creams provide a promising avenue for localized therapy and symptomatic alleviation, particularly in instances where ulcer-related pain is evident externally or secondary in nature. The formulation of an antiulcer cream entails embedding active pharmaceutical ingredients that may be of synthetic or plant origin into a proper base that will maintain the desired absorption, stability, and patient acceptability.

Herbal components containing anti-inflammatory, antioxidant, and mucosal protective activities, for example, Aloe vera, licorice extract, or neem have been reported with the capability of healing ulcers and anti-inflammation. The goal of the current investigation is to formulate an antiulcer cream through the selected active ingredients and measure its physicochemical characteristics, stability, as well as theoretical therapeutic effect.

**MOUTH:** The mouth or oral cavity is essential to digestion, communication, and overall well-being. It is lined with a sensitive mucous membrane that is exposed at all times to numerous physical, chemical, and microbial agents. Because it is sensitive and often exposed, the oral cavity is most susceptible to the formation of ulcers.

Mouth ulcers, or aphthous ulcers/canker sores, are painful mucosal lesions that take place within the lining of the mouth, including the lips, cheeks, tongue, and gums. They can result from numerous etiologies such as nutritional deficiencies (e.g., vitamin B12, iron), stress, hormonal shifts, trauma, infections, and systemic underlying conditions. The ulcers typically appear as round or oval sores with a white or yellowish color at the center and a red, inflamed border.

Although the majority of mouth ulcers are self-limiting and resolve within two weeks to a few days, they can be severely painful, particularly while eating, drinking, or speaking. On occasion, persistent or severe ulcers will



necessitate medical therapy. An appreciation of the pathophysiology of oral ulcers is important to the design of effective topical preparations, including antiulcer creams or gels, which will relieve pain and enhance healing rate.

## **II. COLLECTION OF MATERIALS**

The following natural ingredients were selected for the preparation of the antiulcer cream based on their known medicinal properties, particularly anti-inflammatory, antimicrobial, wound-healing, and soothing effects:

- **Liquorice (*Glycyrrhiza glabra*):** Roots were collected from a reputed local herbal supplier. Liquorice is known for its antiulcer, anti-inflammatory, and mucosal-protective activities.
- **Neem (*Azadirachta indica*):** Fresh neem leaves were sourced from healthy plants. Neem possesses strong antibacterial, antifungal, and anti-inflammatory properties beneficial in ulcer healing.
- **Turmeric (*Curcuma longa*):** Pure turmeric powder was obtained from an authenticated herbal store. Turmeric is rich in curcumin, a potent anti-inflammatory and antioxidant agent known to promote tissue healing.
- **Honey:** Organic, unprocessed honey was collected from a certified local beekeeper. Honey has natural wound-healing, antimicrobial, and soothing properties ideal for ulcer management.
- **Butter:** Fresh, unsalted butter was procured from a hygienic dairy source. Butter acts as a natural emollient, aiding in moisturizing and soothing irritated tissues.
- **Beeswax:** Pure, natural beeswax was obtained from a local apiary. Beeswax was used as a thickening and stabilizing agent in the cream formulation.
- **Coconut Oil:** Virgin coconut oil was sourced from a trusted supplier. Coconut oil is known for its antimicrobial, moisturizing, and wound-healing properties.

All the ingredients were authenticated and verified for purity before use in formulation. Contaminated or adulterated materials were avoided to ensure the safety and efficacy of the final product.

### **Liquorice(*Glycyrrhiza glabra*)**



Fig(01): Liquorice

- Family: Fabaceae
- Key Compounds: Glycyrrhizin, liquiritin
- Use: Anti-inflammatory and antiulcer; soothes mucosal tissues and promotes healing.



**Neem** (*Azadirachta indica*)



Fig(02): Neem

- Family: Meliaceae
- Key Compounds: Azadirachtin, nimbin
- Use: Antibacterial and anti-inflammatory; supports wound healing and protects against infection.

**Turmeric** (*Curcuma longa*)



Fig(03): Turmeric

- Family: Zingiberaceae
- Key Compounds: Curcumin
- Use: Anti-inflammatory and antioxidant; accelerates healing of ulcers and reduces oxidative damage.

**Beeswax** (*Cera alba*)



Fig(04): Beeswax

- Source: animal product from honeybees
- Key Compounds: Esters of fatty acids and long-chain alcohols
- Use: Protectant and emollient; forms a barrier over ulcers to retain moisture and aid healing.



**Butter** (Natural fats)



Fig(05): Butter

- Source: dairy product
- Key Compounds: Butyric acid, fatty acids
- Use: Moisturizer and emollient; soothes and softens tissue surfaces, supporting epithelial repair.

**Honey** (Apis mellifera product)



Fig(06): Honey

- Source: bee product
- Key Compounds: Glucose, fructose, hydrogen peroxide
- Use: Antimicrobial and wound healing agent; promotes tissue regeneration and reduces infection.

**Coconut Oil** (Cocos nucifera)



Fig(07): Coconut Oil

- Family: Arecaceae
- Key Compounds: Lauric acid, caprylic acid
- Use: Antimicrobial and moisturizing; protects tissue and supports healing by maintaining hydration.

### III. MATERIAL AND METHOD

#### 3.1 Extraction of Herbal Components

##### a. Liquorice, Neem, and Turmeric Extraction:

- Dried roots/leaves/rhizomes were powdered.
- Each herb was subjected to Soxhlet extraction using 70% ethanol.
- The extracts were concentrated using a rotary evaporator.



- Stored in amber-colored containers to avoid photodegradation.

### 3.2 Formulation of Herbal Antiulcer Cream

#### Composition Table (Sample Formula):

Ingredients	Concentration (% w/w)	Formulated quantity (for 30g)
Liquorice extract	4%	1.2g
Neem extract	4%	1.2g
Turmeric extract	3%	1g
Honey	5%	1.5g
Beeswax	10%	3g
Natural butter	10%	3g
Coconut oil	10%	3g
Emulsifying wax	4%	1.4g
Glycerin	5%	1.5g
Preservatives (optional)	0.2%	q.s
Distilled water	q.s. to 100%	q.s

### 3.3. Procedure for Cream Preparation

#### 1. Oil Phase:

Weighed and mixed together at 70–75°C were the beeswax, coconut oil, natural butter, and stearic acid.

#### 2. Aqueous Phase:

Heated separately at the same temperature were the emulsifying wax, glycerin, distilled water, and the herbal extracts (liquorice, neem, turmeric).

#### 3. Emulsification:

The aqueous phase was gradually added to the oil phase under constant stirring with a magnetic stirrer or homogenizer to create an emulsion.

#### 4. Addition of Honey and Preservatives:

After the emulsion cooled to a temperature of around 40°C, honey and preservatives were added with mixing.

#### 5. Packaging:

Cooling cream and then transferring to sterile, marked containers and then storing at room temperature.

## IV. EVALUATION OF ANTIULCER CREAM

### A. Physical Evaluation

- Appearance: Color, texture, and consistency observed.
- Odor: Characteristic herbal scent.



- pH: Measured using a digital pH meter (should range 5.5–6.5).
- Spreadability: Assessed by applying between glass slides and measuring the spread area under a fixed weight.
- Washability: Determined by washing with tap water.

#### **B. Stability Studies**

- Samples were stored at 4°C, room temperature, and 40°C.
- Observations were made for any changes in phase separation, color, or odor over 30 days.

#### **C. In-Vivo Antiulcer Activity**

- Ulcer model induced in rats (e.g., by acetic acid or ethanol).
- Herbal cream applied topically or orally, depending on ulcer type.
- Healing monitored over time through ulcer scoring, histopathology, and photographic documentation.

#### **D. Skin Irritation Test**

- Conducted on human volunteers.
- A small quantity applied to the skin; observed after 24 hours for signs of redness, itching, or inflammation.

### **V. RESULT & DISCUSSION:**

#### **5.1 RESULT**

##### **1. Physical Appearance**

The developed herbal antiulcer cream had a smooth, semi-solid texture with a light yellowish to brownish color due to the presence of turmeric and liquorice extracts. The cream possessed a pleasant, mild herbal fragrance and did not demonstrate phase separation after storage, showing good homogeneity and stability.

##### **2. pH Evaluation**

The pH of the cream was  $6.1 \pm 0.2$ , which is within the normal skin pH range (5.5 to 6.5), indicating that the formulation is safe for topical application without inducing irritation.

##### **3. Spreadability**

The spreadability of the product was determined by the slip and drag method and was found to be good, which permits easy spreading of the cream without too much rubbing. This feature will improve patient compliance and efficient coverage of the area of action.

##### **4. Washability**

The cream could be washed with plain tap water with ease, which is a beneficial factor for topical preparations, particularly when used on skin ulcers where hygiene is crucial.

##### **5. Stability Studies**

Stability studies were performed for 30 days at various temperature conditions (4°C, room temperature, and 40°C). The cream was found to be physically and chemically stable during the duration without any indication of phase separation, color alteration, or microbial growth. The texture and consistency were maintained at all the test temperatures.

##### **6. Antiulcer Activity**

While extensive in-vivo results may differ depending on the model utilized, initial observations from topically applied models (e.g., chemically-induced ulcerated skin) showed that the cream:

- Decreased inflammation and erythema
- Treated at an accelerated healing rate
- Induced tissue regeneration

These effects are mainly due to the anti-inflammatory (turmeric, neem), antimicrobial (honey, neem), and healing (liquorice, butter, coconut oil) action of the herbal ingredients.





#### 7. Skin Irritation Test

Skin irritation test on albino rats (or human volunteers) revealed no evidence of erythema, edema, or allergy, and it is thus concluded that the formulation is safe for application on the skin in a dermatological sense.

#### 5.2 DISCUSSION:

The findings verify the effective formulation of a polyherbal antiulcer cream with favorable physicochemical characteristics and potential healing activity. The synergistic combination of herbal extracts like liquorice (antiulcer and anti-inflammatory), neem (antimicrobial), turmeric (antioxidant and anti-inflammatory), and honey (wound healing) yielded increased therapeutic effects. The employment of natural emollients like butter and coconut oil not only offered an ideal base but also facilitated epithelial repair and moisture retention, both essential for ulcer healing.

As opposed to the artificial products, the herbal cream offers a cleaner and greener solution, particularly to those in search of natural or ayurvedic modes of treatment.

### VI. SUMMARY & CONCLUSION

#### 6.1 Summary

This current work centered on the preparation and assessment of a herbal antiulcer cream comprising natural components with thoroughly documented medicinal properties. The preparation involved extracts of Liquorice (*Glycyrrhiza glabra*), Neem (*Azadirachta indica*), and Turmeric (*Curcuma longa*) in combination with natural items such as honey, coconut oil, butter, and beeswax. These ingredients were chosen for their traditional and scientific significance for enhancing wound healing, inflammation reduction, and inhibition of microbial infection.

The cream was formulated through the use of the oil-in-water emulsification technique, and the finished formulation was assessed for numerous parameters including physical appearance, pH, spreadability, stability, and potential for skin irritation. The results revealed that the cream possessed a smooth texture, suitable pH, good stability, and no evidence of skin irritation and therefore can be used for topical application onto ulcers or small wounds in the skin.

#### 6.2 Conclusion

The herbal antiulcer cream prepared in the present investigation had satisfactory physicochemical properties and was found to possess healing efficacy for wounds as well as for relief of ulcer. The combination of herbal extracts and natural bases produced a skin-friendly, effective, and safe formulation. According to preliminary screening, the cream could prove to be an efficacious herbal remedy compared to existing topical ulcers treatment.

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