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Review Article

Formulation and Evaluation of Oral Antiulcer Gel from Liquorice and Calendula Extract

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ABSTRACT

Mouth ulcer is a most common condition that we encounter. Clinically the disease is single or multiple superficial, deep sealed and are associated with microbial attack. Mouth ulcer is painful round or oval sores that form in the mouth. most common often on the inside of the cheeks or lips. In research work, mouth ulcer gels were formulated incorporating the liquorice extract and calendula using Carbapol 250 as the gelling agent. The prepared formulation was evaluated for various parameters like physical appearance, pH, spread ability, homogeneity, gelling temperature, viscosity, stability. The aim of present study to formulate and evaluate oral anti-ulcer gel from liquorice extract and calendula by using different concentration.

INTRODUCTION

ULCER: -

An ulcer is a break in the continuity of the covering epithelial, either skin or mucous membrane with loss of surface tissue, necrosis of epithelial tissue is called as ulcer.

Types of ulcers: -

1. Duodenal Ulcer
2. Gastric Ulcer
3. Mouth Ulcer

Mouth ulcer: -

A mouth ulcer is an ulcer that occurs on the mucous membrane of the oral activity. They are painful round or oval sores that form in the mouth mainly on the inside the cheeks or lips. Mouth ulcer is very common and they occur in association with many diseases and by different mechanism, but usually there is no serious underlying cause.

Types of mouth ulcer:

1. Canker Sore: It is the most common type of mouth ulcer. It is caused due to biting your cheek,

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acidic food, etc. They are usually white or yellow with red around.

2. Leucoplakia: This condition causes white or grey patches inside your mouth. It is mainly caused due to smoking or chewing tobacco.

3. Oral Thrush: It commonly happens after antibiotic treatment or when your immune system isn't strong. Oral thrush causes red and creamy white mouth sores and patches

4. Erythroplakia: This condition caused due to smoking or chewing tobacco. Erythroplakia causes red patches behind the lower front teeth or under their tongue.

Factors responsible for mouth ulcer: -

1. Stress
2. Nutritional Deficiencies
3. Mechanical Injury
4. Poor Oral Hygiene
5. Indigestion
6. Hormonal Imbalance, etc.

GEL

Pharmaceutical gels are semisolid system in which there is interaction between colloidal particles within a liquid vehicle.

Gels are semisolid dosage form in that dispersion of small or la molecules in an aqueous liquid vehicle. They produce jelly like consistency by the addition of gelling agent.

Types of Gel:

1. Single phase gel system:

i] Hydrogels

ii] Organogels

2. Biphasic phase gel system

Advantages of Gels:

- It can be administered anywhere and anytime without water.
- The treatment can be terminated easily at any time, if required.
- Highly acceptable by children, elderly patient.

Disadvantages of Gels: -

- High Cost.
- The gelators or additives may cause irritation.
- Water content increase possibility of fungal or microbial attack.

REVIEW OF LITERATURE:

1. Swati Chauhan et al.,2017: Author was studied that the Glycyrrhizic acid is a widely used medicinal component as an anti-inflammatory agent, antiulcer agent, anti-allergy agent and anti-psoriatic agent. The present investigation deals with the extraction of Glycyrrhizic acid from liquorice roots and evaluating its in-vitro anti-inflammatory activity.

2. Jalal Bayati et al.,2013: Glycyrrhiza glabra Linn, a commonly used herb in ayurvedic medicine. Studies indicate that Glycyrrhiza glabra Linn possesses antibacterial, antioxidant, antimalarial, antispasmodic, anti-inflammatory and anti-hyper glycaemic properties.

3. Sivakumar Annadurai et al.,2021: There are more than 30 species of Glycyrrhiza genus extensively spread worldwide. It was the most prescribed herb in Ancient Egyptian, Roman, Greek, East China, and the West from the Former Han era. There are various beneficial effects of liquorice root extracts, such as treating throat infections, tuberculosis, respiratory, liver diseases, antibacterial, anti-inflammatory, and

immunodeficiency. On the other hand, traditional medicines are getting the attraction to treat many diseases.

4. Sundararaman p et al.,2018: Ulcer is a break in continuity of the epithelium brought about by molecular necrosis. Ulcers are most common in the oral region, for which the patient seeks help from their physician/dental surgeon. The presenting complaints are usually redness, burning sensation and/or pain. They can present in any part of the oral cavity but may be painful if it occurs in the movable area.

5. Shubham Mittal: The mouth ulcer often caused pain and discomfort and may alter the person choice of food while healing occurs. The two most common oral ulceration are Local trauma and Aphthous stomatitis. This review focuses on the causes of mouth ulcer, factors responsible for the mouth ulcer. As we know herbal medicine is the main stay of primary healthcare because of better culture acceptability, better compatibility with human body and lesser side effects.

6. Preethi and Kuttan, 2009: The authors demonstrated that Calendula officinalis extract shows strong wound-healing and anti-inflammatory activity by enhancing epithelial regeneration and reducing inflammatory mediators.

7. Parente et al., 2012: Their study confirmed that topical application of Calendula officinalis significantly accelerates wound healing and reduces inflammation, supporting its use in ulcer and mucosal lesion treatment.

AIM AND OBJECTIVES: -

Aim: Formulation and Evaluation of oral herbal antiulcer gel from liquorice extract and calendula.

Objectives:

- Reduce burning sensation and swelling.
- To extract and standardize bioactive constituents from Glycyrrhiza glabra.
- To formulate oral herbal antiulcer gels with suitable polymers.
- To evaluate physicochemical parameters of the gels.

PLAN OF WORK:

- Plant Sourcing
- Extraction Procedure
- Preparation of gel base
- Incorporation of herbal extract
- Gel formulation

MATERIALS AND EQUIPMENTS: -

Materials:-

| Sr. No | Ingredients | Role of ingredients |
|--------|--------------------|---------------------------|
| 1 | Liquorice Extracts | Enhancing mucosal defense |
| 2 | Carbapol 250 | Gelling agent |
| 3 | Methyl paraben | Preservative |
| 4 | Propyl paraben | Preservative |
| 5 | Propylene glycol | Stabilizer |
| 6 | Triethanolamine | Ph adjustment |
| 7 | Distilled water | Vehicle |

Equipment:-

| Sr. No | Equipments | Manufacturer |
|--------|------------------|----------------------------------|
| 1 | Beaker | Borosil |
| 2 | Glass rod | Swift class compony |
| 3 | Weighing balance | Mettler toledo |
| 4 | Mortar & pestle | Vinayak art and marble |
| 5 | Stirrer | Jalisbo |
| 6 | Water bath | Arson |
| 7 | Digital pH meter | Lab Indian analytical instrument |

DRUG PROFILE: -

1. Liquorice root





- **Synonym:** - Glycyrrhiza, Liquorice root, Mulethi.
- **Biological source:** - Liquorice consists of dried peeled and unpeeled roots, stolon's, stem of Glycyrrhiza glabra linn.
- **Family:** Leguminosae
- **Geographical source:** The drug is commercially cultivated on a scale in Spain, Sicily and England.
- **Cultivation and collection:-**

Spanish liquorice is cultivated in Spain and Italy. The propagation plant is done with young pieces of stolons. Each piece should exhibit buds of aerial shoot. The dried roots of liquorice are purchased from market

Macroscopic Characteristics:

- **Colour:** Unpeeled liquorice externally yellowish brown or dark brown and internally yellowish colour.
- **Odour:** Faint & Characteristics
- **Taste:** Sweet
- **Size:** length 10 to 50 cm Diameter - 2cm

- **Shape:** Unpeeled drug straight and nearly cylindrical

- **Chemical constituents:**

The roots of Glycyrrhiza glabra Linn contain Glycyrrhizin acid

Sugars-Glucose, mannitol Resins, volatile oil

Medicinal and Therapeutic Uses: -

Digestive Health: It is used to help manage indigestion, heartburn, and peptic or mouth ulcers by increasing mucus production and promoting healing of the stomach lining.

Respiratory Health: The extract acts as a demulcent and expectorant, helping to soothe sore throats, calm coughs, and clear excess mucus from the respiratory tract.

Skin Conditions: Applied topically, it may help manage inflammatory skin conditions such as eczema, rosacea, and allergic dermatitis, and can help fade dark spots and hyperpigmentation.

2. Calendula



- **Synonym:-**Calendula, Pot Marigold, English Marigold.
- **Biological Source:-** Calendula consists of dried flower heads of *Calendula officinalis* Linn.
- **Family:-** Asteraceae
- **Geographical Source:-** Cultivated in Europe, Mediterranean region, India, and England
- **Cultivation and Collection:-**

Calendula is cultivated in temperate regions. Fully bloomed flowers are collected and shade-dried. Dried flowers are purchased from the market.

Macroscopic Characteristics

- **COLOUR:-** Yellow to orange
- **Odour:-** Mild, characteristic
- **Taste:-** Slightly bitter
- **Size:-** Flower diameter: 3–5 cm
- **Shape:-** Flower heads with ray and disc florets.
- **Chemical Constituents:** Flavonoids, Triterpenoids, Carotenoids, Essential oil, Saponin

RESULT:

The liquorice Extract and Calendula has been consistently reported to possess significant antiulcer, anti-inflammatory, antimicrobial, and mucoprotective properties due to the presence of bioactive constituents such as glycyrrhizin, flavonoids, saponins, and tannins. Studies indicate that liquorice enhances mucosal defence, promotes epithelial healing, and reduces inflammation and pain associated with oral ulcers.

Herbal formulations containing liquorice extract, particularly in gel dosage forms, have shown good patient acceptability, suitable physicochemical characteristics, and minimal local side effects when used topically. Overall, the literature supports the potential of liquorice-based oral gels as a safe and effective herbal alternative for the management of mouth ulcers.

7. CONCLUSION:

Natural remedies are more acceptable in the belief that they are safer with lesser side effects than the synthetic medicines. Nowadays herbal formulation have increasing demand in the world market It is very good attempt to establish herbal gel of liquorice and Calendula extract.

The gel formula exhibited good physicochemical evaluation parameters like physical appearance, pH, homogeneity, Spreadability, gelling temperature, stability, etc. In addition, it demonstrated good stability at room temperature easily prepared and store at room temperature. It in this works a suitable new herbal antiulcer topical gel formulation was proposed to enter into the mark.

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