



## **Formulation and Evaluation of Herbal Lollipop of Ginger Powder and Clove Oil to Treat Oral Thrush**

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### **ABSTRACT :**

There are a number of dosage forms available on the market, but more that work both locally and systemically are needed. The current study's advantages include a longer period of time that the dose form remains in the oral cavity, enhanced bioavailability, and a decrease in gastrointestinal discomfort due to first-pass metabolism. Lollipops are medicinal dose forms with flavors that are meant to be swallowed and kept in the mouth or throat. Typically, the sweetened base of the lollipop contains one or more medications. The purpose of a medicated lollipops is to increase patient acceptance and compliance. The lollipops were made with methylcellulose and citric acid as the polymer through a heating and congealing process. To increase patient acceptance, we must make the medication taste better with mannitol, honey, and sugar. Different plasticizers, such as glycerine and propylene glycol, increase texture and elasticity.

Lollipops are medicinal dose forms with flavors that are meant to be sucked and kept in the mouth or throat. They typically include one or more medications in a sweetened foundation. The purpose of lollipops is to alleviate oropharyngeal symptoms, which are frequently brought on by local infections. Lollipops are used for treatments that are meant to be administered gradually to maintain a steady level of drug in the oral cavity as well as for patients who are unable to swallow solid oral dose forms. Analgesics, anesthetics, antimicrobials, antidepressants, antiseptics, antitussives, aromatics, astringents, corticosteroids, decongestants, and demulcents are among the medications frequently included in Lollipop. Additionally, Lollipops with one or more ingredients can be synthesized based on the needs of the individual patient. The preparation of lollipops might include either compression or molding, depending on the kind.

**KEYWORDS:** Lollipop, Plasticizers, Candida albicans, Oral thrush, Clove oil, Ginger.

### **OBJECTIVE:**

Herbal lollipops used in treatment for oral thrush could include developing an effective remedy with natural ingredients, minimizing side effects, and ensuring antimicrobial properties to combat the fungal infection. Additionally, the goal may involve creating a product that promotes oral health and soothes symptoms associated with oral thrush.

### **INTRODUCTON:**

One kind of thrush that develops in the mouth is called oral thrush. A yeast or fungal infection of the species Candida that appears on the oral mucous membranes is known as oral thrush. Oral candidiasis is another name for oral thrush. Candida albicans is the yeast fungus that causes this kind of illness, while other non-albican species including Candida krusei, Candida parapsilosi, Candida glabrata, Candida tropicalis, and Candida dubliniensis can also cause it. As the species of Candida are naturally occurring parts of the oral flora, the disease results from altering the usual oral environment, not from an actual encounter or "infection."

White, creamy sores on the tongue or inner cheeks are indications of oral thrush. Oral thrush can occasionally spread to the back of the throat, the tonsils, gums, or roof of the mouth. While anybody can have oral thrush, those with weakened immune systems, such as newborns and elderly individuals, those on particular drugs, and those with compromised immune systems are more susceptible to the illness. If you're healthy, oral thrush is a small issue; but, if your immune system is compromised, your symptoms could be more severe and challenging to manage.

### **Classification of Oral Candidiasis**

#### **1] Primary oral candidiasis (Group I)**

- Acute
  - Pseudomembranous
  - Erythematous
- Chronic
  - Erythematous
  - Pseudomembranous
  - Hyperplastic
  - Nodular
  - Plaque-like
- Candida-associated lesions
  - Angular cheilitis
  - Denture stomatitis
  - Median rhomboid glossitis
- Keratinized primary lesions superinfected with Candida
  - Leukoplakia
  - Lichen planus

## 2]Secondary oral candidiasis (Group II)

Oral manifestations of Systemic mucocutaneous. Candidiasis (due to diseases such as thymic aplasia and candidiasis endocrinopathy syndrome).

### Causes of oral thrush

Our bodies are filled with trace levels of the fungus *Candida*. It is present in the digestive system, skin, and mouth. Generally speaking, these fungi do not damage healthy individuals. But when *C. albicans* gets out of control, those who take certain drugs, have weakened immune systems, or have specific medical problems are more prone to oral thrush. In a normal state, your immune system balances the “good” and “bad” germs that live in your body by warding off dangerous invaders like viruses, bacteria, and fungus. However, occasionally these defenses falter, which raises the candida fungal population and permits an oral thrush infection to spread. *Candida albicans* is the most typical kind of candida fungus. Your risk of oral thrush might be elevated by a number of circumstances, including a compromised immune system.

### Risk factors for oral thrush

According to the Centres for Disease Control and Prevention (CDC) - those under 1 month of age have a higher chance of developing oral thrush. Adult oral thrush is more likely to become a problem for the following groups:

**1.Dentures:** *Candida* is a form of fungus that typically causes denture stomatitis, also known as oral stomatitis (yeast). Small quantities of candida in your mouth are typical. However, if there is an imbalance, the candida may spread unchecked and cause a fungal illness. Oral thrush is more likely to strike those who wear dentures. particularly if they don't take them out before bed, they possess dentures that don't fit well, or they don't keep them clean.

**2.Weakened immunity:** Due to lowered immunity, oral thrush is more common in elderly persons and newborns. Certain medical illnesses and therapies, such HIV/AIDS, cancer and related treatments, organ transplants and necessary immunosuppressive medications, might weaken your immune system.

**3.Diabetes:** If you have untreated diabetes or the disease isn't well-controlled, your saliva may contain large amounts of sugar, which encourages the growth of candida.

**4.Medications:** Drugs such as prednisone, inhaled corticosteroids, or antibiotics that disturb the natural balance of microorganisms in your body can increase your risk of oral thrush.

**5.Malnutrition:** deficiency in iron the most common nutrient linked to the growth of candida. Other nutritional deficiencies related to an increase of oral thrush risk include:

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|---------------|----------------|
| i. vitamin A  | iii.folic acid |
| ii. magnesium | iv.zinc        |

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## SYMPTOMS OF ORAL THRUSH:




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## CHILDREN AND ADULTS :

At first, oral thrush symptoms could go unnoticed. Among the signs and indicators are:

- On your tongue, inside cheeks, and occasionally on the tonsils, roof of your mouth, there may be creamy white lesions.
- Lesions that look like cottage cheese and are somewhat elevated
- Any redness, stinging, or discomfort that might make it difficult to swallow or eat
- Cracking and redness around the mouth's corners
- Loss of taste
- Redness, irritation and pain under denture (denture stomatitis) In severe cases, usually related to cancer or a weakened immune system from HIV/AIDS, the lesions may spread downward into your oesophagus –the long, muscular tube stretching from the back of your mouth to your stomach (Candida esophagitis). If this occurs, you may experience difficulty swallowing and pain or feel as if food is getting stuck in your throat.

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## INFANTS AND BREAST FEEDING MOTHERS:

Not only do newborns have characteristic white mouth lesions, but they can also be fussy, irritable, and have difficulty feeding. As the mothers are nursing, they may infect the mothers. The baby's mouth and the mother's breasts could become infected with each other.

The following symptoms and indicators may be present in women with a candida infection in their breasts ;

- i. Exceptionally sensitive, red, cracked, or itching nipples
- ii. The skin in the darker, circular area is shiny or flaky.
- iii. Unusual discomfort while nursing or uncomfortable nipples in between feedings
- iv. Stabbing pains deep within the breast

### **OTHER SYMPTOMS:**

- i. cracks at the corners of the mouth
- ii. an unpleasant taste
- iii. pain, such as a sore tongue or gum
- iv. difficulty eating or drinking

### **TREATMENT OF ORAL THRUSH:**

Doctors will usually prescribe anti-fungal medications, such as nystatin or miconazole, in the form of drops, gel, or lozenges. Alternatively, a doctor may prescribe a topical oral suspension. To take this treatment, a person washes it around their mouth for a few minutes and then swallows or spits out the solution (depending on the formulation).

### **HOME REMEDIES FOR ORAL THRUSH**

Alongside medical treatment, the following can help reduce the risk of worsening the condition:

- 1) rinsing the mouth with salt water
- 2) using a soft toothbrush to avoid scraping the lesions

- 3) using a new toothbrush every day until the infection has gone
- 4) eating unsweetened yogurt to restore healthy bacteria levels
- 5) avoiding using mouthwashes or sprays

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## DETAILS OF LOLLIPOP:

Pharmaceutical companies are now focusing on the development of new drug delivery systems for existing drug with an improved efficacy and bioavailability together with reduced dosing frequency to minimize side Effects. There are many drugs dosage forms like lollipop lozenges, tablets, mouthwash, and topical gel, are in markets for the treatment of the oral infections. New drug design to this area always benefit for the patient, physician and drug industry is lollipops. The word "Lollipop" is derived from French word "Lollipop" which means a diamond shaped geometry having four equal sides. Lollipop and various shapes have been developed since 20th century in pharmacy and are still under commercial production. Lollipops are solid preparations that are intended to dissolve in mouth or pharynx. They may contain one or more medicaments in a flavoured and sweetened base and are intended to treat local irritation, infection of mouth or pharynx and may also be used for systemic drug absorption. Lollipops are better innovative dosage form placed in oral cavity. Today lollipops contain different category of medicament as follows: analgesics, anaesthetics, antimicrobials, antiseptics, antitussives, astringents, decongestants, demulcents and other classes and combinations of drugs. Depending on the type of lozenge they may be prepared by moulding (Pastilles) and Compression tablets (Troches).

### *Advantages*

- It can be given to those patients who have difficulty in swallowing
- Easy to administer to geriatric and pediatric population.
- Do not require water intake form administration.
- Taste of the drugs can be masked by sweeteners and flavours used in the formulation.
- It can Increase in bioavailability
- It can Reduced dosing frequency.
- It can reduce gastric irritation.
- It can improve onset of action.

### *Disadvantages*

- Some drugs may not be suitable with aldehyde candy bases e.g.; benzocaine.
- Children having above 6 years of age can use lozenges safely.
- Possible draining of drug from oral cavity to stomach along with saliva.
- A hard candy lozenge is the high temperature required for their preparation.
- Hard lozenges become grainy.

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## Drug profile:-

### 1.Ginger Powder

**Synonym-**Zingiber

**Family-**Zingiberaceae

**Chemical constituents-**

- 1.Gingerol
- 2.shogaols

**Uses-** Used as anti-inflammatory



**2.Clove oil****Synonym**-Eugenia caryophyllata**Family**-Mirtaceae**Chemical constituents-**

1.Eugenol

2.Eugenol acetate

**Uses** -Used as antifungal agent

Sr. No.	Ingredients	Quantity required
1.	Ginger powder	6.5 gm
2.	Clove oil	40 drop
3.	Sugar	40gm
4.	Citric acid	0.2gm
5.	Honey	5 tablespoonful
6.	Glycerine	Q.s
7.	Water	1/4 <sup>th</sup> of sugar quantity

**Formulation Table****Method**

**Step-1:** The desired quantity of sugar was dissolved in water by heating and stirring in a vessel until sugar was completely dissolved. Corn syrup was added when the cooking temperature reaches 110°C. Cooking was then continued to 145 - 156°C till the syrupy base becomes thick

**Step-2:** The finished cooked syrup (154.4°C) was then placed in vacuum chamber which was maintained at 274 mm Hg for about 30 minutes to remove the traces of water molecules and to give plasticity to the base prepared.

**Step-3:** The candy base was then transferred to a water-jacketed stainless steel for cooling . The mixing was done manually. During the mixing cycle, temperature of candy base (154°C) was brought to 90°C to form a solidified mass. At this stage the Drug, polymers, citric acid, other excipients such as sweetening agents, flavouring agents were added manually and mixed thoroughly.

**Step-4:** Then this solidified mass was poured in Calibrated mould and add sticks .

**Step- 5:** formation of the individual Lollipop.

**Step-6:** The product (Lollipops) placed on the desecrator .Then the dried Lollipops is then taken in other container and lubricated with oils so that prepared Lozenges should not stick to each other.

**Step-7:** The prepared lollipops were packed in the aluminium foil.

**Fig. Prepared Lollipop****Evaluation parameter:****Weight variation:**

This can be performed by following method. The weight variation were conducted by weighing 5 lollipops individually and average weight and standard deviation were calculated

#### Hardness:



Hardness can be performed by following method. The hardness was determined by using Monsanto hardness tester. The test was performed for 5 lollipops and average value and standard deviation was calculated.

#### Friability:



Friability can be performed by following method. The friability of lollipops was determined by using Roche friabilator. Weigh all the lollipops and note down reading as initial weight. Then weighed lollipops were placed in the friabilator and operate for 4 minutes at 25 rpm. Then lollipops are reweighed and note down reading as final weight. Friability were calculates.

$$F = \frac{(\text{initial weight} - \text{final weight})}{\text{initial weight}} \times 100$$

Initial wright

#### Diameter and Thickness:



This test can be performed by following method. Diameter and thickness was conducted by using 5 lollipops. The diameter and thickness of lollipops were measured by using Vernier calliper. The average value and standard deviation was calculated.

**Drug Content:** Lollipops dissolved in 100 ml distilled water and sonicated for 30 min and filtered. From the above solution 1 ml was taken in volumetric flask and diluted up to 10 ml (100µg/ml) and it was analysed spectrophotometrically at 224 nm.

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#### Result :-

##### EVALUATION PARAMETERS :

Nature – Hard

Colour – Brownish

Odor– Characteristics

Diameter- 4 cm

Friability- 6.8 %

Thickness- 0.8 cm

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#### CONCLUSION :

In the present study, an attempt was made to formulate and evaluate herbal lollipops of ginger powder and clove oil for the treatment of oral thrush. The main interest in such a dosage form was for the development of new herbal dosage form and to see the effect of different herbal drugs on oral thrush.

Herbal lollipops of ginger powder and clove oil were prepared by heating and congealing method. In this methyl cellulose, citric acid and sugar. Evaluation parameters like thickness, weight variation, hardness show that they were within the limits.

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