International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 08 Issue: 05 | May - 2024 SJIF Rating: 8.448 ISSN: 2582-3930

# Preparation and Formulation of Herbal Hard Lozenges

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**Abstract**

The herbal based lozenges were formulated properly to provide proper relief from the cough symptoms by using natural herbal ingredients with potential and therapeutic properties. Our research involved with the proper and appropriate preparation of the lozenges we followed by evaluation, identification and analysis of their physical characteristics, organoleptic properties and antimicrobial testing.

● Keyword: Lozenges, Troches, Guduchi, Liquorice

## Introduction

Oral dosage forms are different and have advantages over other dosage forms. They are economical and safe for the patient. They are the most natural and easiest way to administer the medicine. Their toxicity is delayed due to the effect, which allows easier recovery than with other formulations. They are suitable for all patients their toxicity is slowed due to an effect that allows easier recovery than with other forms of medication. They are suitable for all patients regardless of age. Oral dosage forms also have disadvantages. If the patient suffers from chronic vomiting, it is not the first choice of medicine. They are not a good choice for uncooperative patients such as children and infants. They are not suitable for emergency or unconscious patients. They are not suitable for patients with gastrointestinal disorders such as diarrhoea, constipation, ulcers and hyperacidity of the stomach. Oral formulations are not suitable for drugs that are susceptible to GIT inactivation or destruction.[1]

"Dissolvable tablets are a solid dosage form containing flavors and sweeteners designed to slowly dissolve or disintegrate in the mouth or oral cavity. Most often, they are used for a local effect in the oral cavity, and they can also have a systemic effect if they are well absorbed by the oral mucosa and pharynx." [2] Troms are solid preparations containing one or more substances in a usually salty, sweet base designed to slowly dissolve or disintegrate in the mouth.[3] They can be made by moulding or compressing sugar-based tablets. The development of troches dates back to the 20$^{th}$ century and is still in commercial production. Most lozenges are available over the counter. Lozenges provide a palatable way of administering dosage forms and enjoy their position in the pharmaceutical market due to certain advantages.[4],[5] Many experts say that if there is any benefit from taking zinc or a zinc tablet, it is very minimal. [6], [7]

Advantages of natural ingredients: Herbal lozenges are made with natural ingredients, which mean they do not contain synthetic chemicals or artificial additives. Potentially effective: Some herbs used in herbal lozenges have been shown to have medicinal properties that can help soothe sore throats, reduce coughing, and promote overall

wellness. Fewer facet outcomes: Because they may be made with herbal ingredients, natural lozenges may also have fewer facet outcomes in comparison to conventional medicines. Easy to use: Herbal lozenges are clean to use, as they may be taken orally and do now no longer require any unique system or preparation. Available over-the-counter: Many herbal lozenges are available over-the-counter, which makes them easily accessible.

**Some of the common purposes of herbal lozenges can be:**

1. Relief of symptoms of cough and sore throat.

2. Promote respiratory health.

3. Strengthen the immune system.

4. Supporting digestion and intestinal health.

5. Relaxation and tension.

6. Alleviation of allergy symptoms.

7. Maintaining oral health and hygiene.

**Materials and method**

**INGREDIENTS:**

**Liquorice:** It can be made by extracting the liquorice's root. In regions of Asia, including Southern Europe and India, liquorice naturally grows as *herbaceous perennial legume*. It is commonly utilized in the Indian market and is also known as Jestamadu and Muretti. Ayurvedic medical system for treating a range of respiratory conditions. It is employed as a mucous agent and expectorant. This Glycyrrhizin acid is responsible for certain characteristics.[25]

**Guduchi:** A member of the Heart-leaved Moonseaceae family, Guduchi is made from mature, dry stems of *Tinospora cordifolia*. Giroy is the name of a very common herb in Ayurveda that is frequently used to treat fever, respiratory issues, diabetes, anaemia, heart damage, etc more.[26]

**Turmeric:** These are the dried rhizomes of the ginger family member turmeric. Due to its bright yellow hue, turmeric is one of the spices that is most frequently used in Indian cooking. It is used to treat bronchitis and coughs because of its antiseptic characteristics. and other issues with the upper respiratory system. It contains curcuminoids, the primary component of many curcumin-based products.

**Ginger:** Ginger is *Zingiber officinale*. It is well-known for its antioxidant, analgesic, and anti-inflammatory effects, which make it a popular component in herbal medicines for a variety of illnesses, including respiratory conditions like colds and coughs. It's critical to remember that ginger have effects that thin the blood, therefore anyone taking blood-thinning medications should use them with caution. Bleed problems or taking blood-thinning drugs[28]

**Jaggery:** Made from *the juice or sap of Palmyra*, date, or coconut palms (Phoenix dactylifera, Borassus flabellifer, or Cocos nucifera L., Jaggery is a sweet substance that is high in sugar. goods and medications. It functions as a preservative as well as a sweetener.[29] Through the use of molds and melting, soft lozenges were created. Jaggery was combined with the powder and other components (which had been melted over a water bath) to create a homogeneous mixture. Subsequently, The stainless steel mould was filled with the mixture.[30]

**Honey:** *Bees Apissmallifera, Apisdorsata*, and other species deposit a sweet solution derived from flower nectar onto themselves. Apis (bee). The viscosity of honey has made it renowned as a natural treatment for dry and phlegmy coughs. It has ' an ability to calm the throat, thereby easing any discomfort or irritation. [31]

**Tulsi:** Also known as *holy basil*, Tulsi has long been employed in Ayurvedic medicine for its range of therapeutic advantages.[32]It is a common component in herbal cough medicines due to its anti-inflammatory, anti-bacterial, and anti-viral effects. colds as well as other respiratory conditions.

**Cumin:** A blooming plant of the *Apiaceae* family that is indigenous to the Irano-Turanian Region is called *cuminumcyminum*.[33] Its seeds, which are each encased within a dried fruit, are utilized in many different civilizations' cuisines both whole and crushed. Although cumin is a common ingredient in traditional medicine, there isn't any solid proof to support its efficacy or safety.[34]

**Extraction of raw materials –**

**Tulsi -**The extraction was conducted in a Clevenger apparatus, coupled to a bottom flask of 500 ml. It was added 30 g of crushed leaves of Tulsi or basil and 300 ml of water into the flask. The extracted time was fixed at four hours. The extracted oil was diluted in hexane & filtered after separation.

**Guduchi -** Stems of *Tinospora cordifolia* were dried under shade for 7–10 days and pulverized using an electric grinder. Firstly, dried sample was extracted with solvent of methanol and acetone in the ratio of 70 : 30 (4000 mL × 4 cycles) at 40°C for 16 hours in soxhlet apparatus

**Liquorice -** In this study, a simple and convenient method for the extraction of glycyrrhizic acid and glabridin from liquorice is developed and validated. Mixture of ethanol/water (30:70, v/v) and extraction time 60 min under 50°C is the optimum condition to extract GA and glabridin from liquorice.

**Turmeric -** In order to extract turmeric oil, researchers have used steam distillation, hydro-distillation, and extraction using hexane. Hexane was combined with the oils after curcumin extraction and heated to 60 °C three times for one hour. The solvent was removed, which resulted in successful turmeric oil extraction.

**Ginger –** The dried steamed ginger is baked for 3 hours to 5 hours at a temperature of 20ºC. to 150ºC. in an ocher kiln installed to radiate far infrared rays, and the ginger obtained in the above process is pulverized using a grinder to remove 80 to 150 mesh nets.

**Formulation Table -**

| Sr. No | Ingredients | Quantity |
|---|---|---|
| 1 | Jaggery | 50gm |
| 2 | Liquorice | 500mg |
| 3 | Turmeric | 200mg |
| 4 | Guduchi | 500mg |
| 5 | Honey | q.s. |

| | | |
|---|---|---|
| 6 | Cumine | 250mg |
| 7 | Tulsi | 500mg |

**Evaluation parameters for herbal lozenges**

**1. Physicochemical properties:** Physicochemical properties such as physical stability, colour, odour, taste etc.[35]

| Sr. No | Parameter | Observation |
|---|---|---|
| 1 | Colour | Golden brown |
| 2 | Odour | Pleasant |
| 3 | Taste | Sweet |
| 4 | Texture | Smooth |
| 5 | Shape | Coffee bean shape |

**2. Weight variation test**: 10 lozenges were taken and individual weights were noted, then average weight of lozenges was calculated by total weight divided by ten.[36]

Weight of lozenges = 1.78+1.74+1.80+1.56+1.76+1.74+1.84+1.63+1.59+1.639(gm)

10

=1.707gm

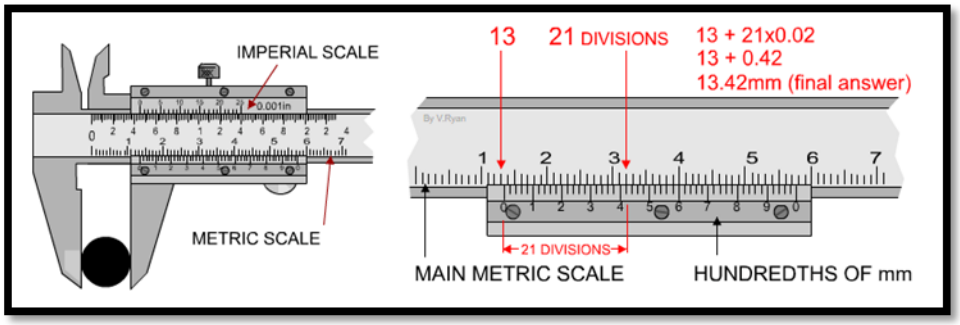
**3.Moisture content:** By Gravimetric method, one gram sample is weighed and placed in a desiccator at for 24 h. Find the initial weight of the sample before drying. Set parameter and dry sample. Weigh sample after drying and compare to the initial weight to calculate the Loss on Drying.[37]

Moisture content = Initial weight - Weight after the test

| Sr. No | Moisture Content |
|---|---|
| 1 | 1.92 |
| 2 | 1.88 |
| 3 | 1.88 |
| 4 | 1.83 |
| 5 | 1.74 |

**4. Thickness test-** The thickness of the lozenges was determined by using vernier caliper. Five lozenges were used. The average values were calculated.[38] Formula

| **Sr. No** | **Average thickness** |
|---|---|
| 1 | 0.90mm |
| 2 | 0.93mm |
| 3 | 0.98mm |
| 4 | 0.95mm |
| 5 | 0.96mm |




**5. Measurement of pH-** The acidity or alkalinity of lozenges was indicated by using lab pH meter, a scale from 1.0 to 14.0. 1% W/Solution was prepared by dissolving 1 g candy in 100 ml distilled water and its pH was recorded.[39]


Acidic in nature ph is given 3.2- 4.1

**6. Friability**- The friability of tablets was determined using Roche Friabilator. It is expressed in percentage (%). Ten tablets were initially weighed and transferred into friabilator. The friabilator was operated at 25 rpm for 4 minutes. The tablets were weighed again after taking out tables and brushing the dust away. If tablets are found broken or cracked and the final value exceed the limit test is consider failed. The value should be no more than 1% (0.5- 1.0%). If exceed repeat three time for overall estimation. The % friability was then calculated with help of following formula. Friability= (Initial Weight -Final Weight) X 100/Initial Weight.[40]


Friability= (17.32gm-17.20gm)×100/17.32gm

Friability= 0.6%

**7. Determination of antimicrobial activity-**

The agar plate method was used to examine the antimicrobial activity of the lozenges. The test compound (50µL) was introduced in the well. The plate was incubated over night at room temperature. The antimicrobial spectrum of the extract was determine for the bacterial species in terms of zone sizes around the well.[41]

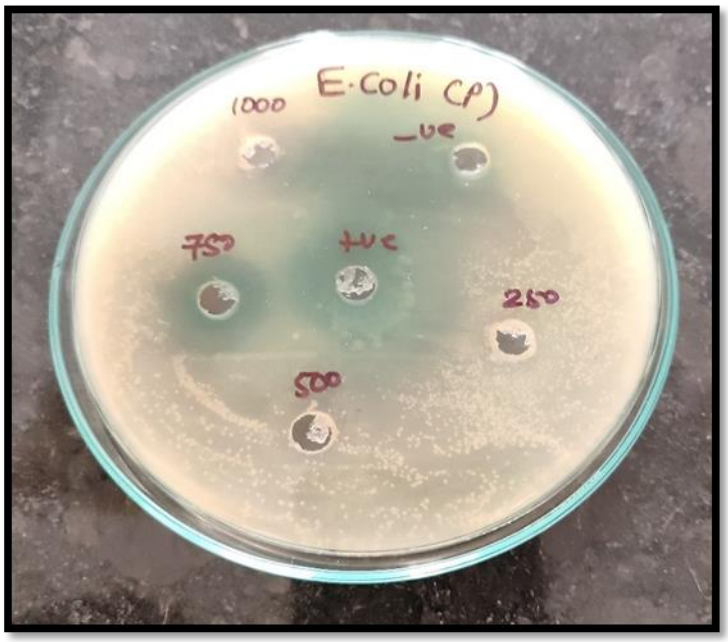



**Fig: MIC against E.Coli**

The result obtained in this study suggest that herbal formulation prepare and possess anti-microbial activity, the component of herbal lozenges was selected due to their reported action that plays preventive and curative role in prevention of cough.

**Result**

The lozenges were prepared with the combination of all powders using jaggery as a base. Physicochemical evaluation was done. Weight variation test were completed and calculate the average weight of lozenges are given **1.707gm**. The quality control parameter such as Moisture content of lozenges was determine and calculate the loss on drying of 5 lozenges that is **0.04%,0.12%,0.13%,0.08%,0.07%.** Thickness test of lozenges are done by using vernier caliper and calculated value is **0.90mm,0.93m, 0.98mm,0.95mm,0.96mm**. PH of lozenges are given is **5-6**. Friability of lozenges is determine it given **0.6%.** Antimicrobial evaluation was done.

**Conclusion**

Purpose behind lozenges was to achieve throat relief. To intention behind formulating herbal lozenges was to prevent the adverse reaction caused by synthetic lozenges.The studied formulation proved to be satisfactory from the perceptive as well. After consuming this lozenges there was no irritation in throat and throat relief was observed.

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