

Review on Lozenges

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Abstract: *Lozenges are palatable unit dosage form administrated in the oral cavity, which is the most common route and easiest way of administering a drug and have a bright future as novel method of delivering drugs for local and systemic effect. However, pediatric, geriatric patients show less compliance in swallowing tablets and capsules due to difficulties in swallowing and bitter taste of many drugs when formulated as liquid dosage form. The benefit of the medicated lozenges is they increase the retention time of the dosage form in the oral cavity which increases bioavailability and reduces first pass metabolism. The present review covers all aspects associated with lozenges like its advantages and disadvantages, its types and their preparation methods, criteria for selecting flavoring agents and quality control of lozenges. The medicaments which can be formulated as lozenges include local anesthetics, antihistamines, antitussives, antiseptics, decongestants, demulcents, and antibiotics.*

Keywords: Lozenge, Troches, Pastilles, Medicaments

I. INTRODUCTION

Lozenges are solid dosage forms that are intended to dissolve slowly in the mouth, releasing the active ingredient. They are commonly used for the treatment of sore throats, coughs, and other respiratory ailments. Here is some general information about lozenge formulation:

- **Active ingredients:** Lozenges can contain a wide range of active ingredients, such as analgesics, antitussives, decongestants, and antiseptics. The choice of active ingredient will depend on the intended therapeutic effect.
- **Excipients:** Lozenges contain a variety of excipients, including binders, fillers, disintegrants, and flavoring agents. Binders help hold the ingredients together, while fillers and disintegrants help with the release of the active ingredient. Flavoring agents are added to improve taste and mask any unpleasant flavor of the active ingredient.
- **Base material:** Lozenges can be made from a variety of base materials, such as sugar, gum, gelatin, or a combination of these materials. The choice of base material will depend on the desired texture, hardness, and dissolution rate of the lozenge.
- **Manufacturing process:** Lozenges are typically made by a compression or molding process. The active ingredient and excipients are mixed together and compressed or molded into the desired shape. The lozenges are then coated with a layer of sugar or other coating material to improve taste and appearance.
- **Packaging:** Lozenges are usually packaged in blister packs or bottles. Blister packs offer individual dosing and protection against moisture and air, while bottles are more convenient for multiple dosing.
- The formulation of lozenges can vary depending on the specific active ingredient and intended use. The formulation process involves careful consideration of the physicochemical properties of the active ingredient, excipients, and base material to ensure that the lozenge has the desired therapeutic effect and patient acceptability.

USES OF LOZENGES:

Lozenges are used for a variety of conditions, primarily related to the respiratory and oral cavities. Here are some common uses of lozenges:

- **Sore throat:** Lozenges are commonly used for the relief of sore throat. The active ingredients in the lozenge help soothe the throat and provide temporary relief of pain and discomfort.

- Cough: Lozenges that contain cough suppressants can be used to relieve coughing. The active ingredients in the lozenge act on the cough reflex to reduce coughing.
- Cold and flu: Lozenges that contain decongestants and/or antihistamines can help relieve symptoms of cold and flu, such as congestion, runny nose, and sneezing.
- Bad breath: Lozenges that contain antiseptic agents can help reduce bad breath by killing the bacteria that cause it.
- Oral health: Lozenges that contain fluoride can help prevent tooth decay strengthening the enamel on the teeth. Lozenges that contain xylitol can also help reduce the risk of tooth decay by preventing the growth of bacteria that cause cavities.
- Motion sickness: Lozenges that contain ginger can be used to relieve nausea and vomiting associated with motion sickness.
- Nicotine addiction: Lozenges that contain nicotine can be used as part of a nicotine replacement therapy to help quit smoking.

The specific use of a lozenge will depend on the active ingredient and the condition being treated. It is important to read the label and follow the instructions for use. If symptoms persist, it is recommended to consult a healthcare professional.

TYPES OF LOZENGES

There are three basic types of lozenges:

- Hard,
- Soft
- Chewable.

Hard lozenges: hard lozenge is generally formed using sucrose or other sugars like the process for hard candy confections that produce a hardened amorphous glassy material. To slow the rate of dissolution, polymers such as PEGs and HPMC may be added. Another type of hard lozenge may be made of compressed powders. An example of this is clotrimazole troches (lozenges) made as a large, compressed tablet that is slowly dissolved in the mouth. The tablet base material is made of dextrose, MCC, and povidone.

Soft lozenges: soft lozenge is often made using PEGs of sufficient molecular weight to provide slow dissolution in the saliva. Additionally, hydrocolloids such as acacia may also be added as an adhesive agent. Soft clotrimazole troches can be made this way by adding drug and acacia to melted PEG 1450 base and pouring into troche molded cavities.

Chewable lozenges: Chewable are typically based on glycerinated gelatin; a base of glycerin, gelatin, and water. This base can be mixed with drug, acacia, and suitable flavoring and sweetening agents.^[20]

ADVANTAGE OF LOZENGES

- Ease of pediatric and geriatric patients.
- Local and systematic effect
- Increase contact time of drug.
- Prolong drug action.
- Cost of production is less

DISADVANTAGE OF LOZENGES

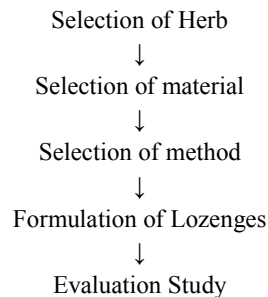
- Possible draining of drug into the stomach
- Accidental swallowing of entire dosage form
- Non-uniform distribution of drug in the saliva for local administration.

IDEAL PROPERTIES OF LOZENGE

- Is a solid preparation consisting of sugar and gum, the latter giving strength and cohesiveness to the lozenges.
- Facilitating slow release of the medicament.

- It is used to medicate the mouth and throat for the slow administration in digestion or cough remedies.
- It is intended to dissolve slowly in the mouth to temporarily suppress the cough and lubricate and soothe irritated tissues of the throat.
- Some have medications that help fight colds, and most have anesthetic to help ease the pain.
- Lozenges also contain menthol or eucalyptus, which can help cool and soothe the throat

How to prepare:



HERBAL DRUG PROFILE :

TULSI:

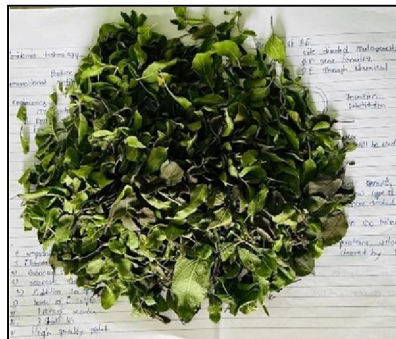


Fig 1 : Tulsi

Hindi Name: **Tulsi** Sanskrit Name: **Tulsi** English Name: **Holy Basil**

Latin Name: **Ocimum sanctum Linn**

Indian mythology attaches a great significance to Basil by recognizing it as a holy herb. Perhaps, such significance comes from the actual health applications of the herb. Its use is recommended as a first aid in the treatment of respiratory, digestive, and skin diseases. Apart from these common ailments, Ayurveda also recognizes its use for the diseases ranging up to tumorous growths. Experimental studies identify it to be a highly promising immunomodulator, cytoprotective and anticancer agent.

Tulsi or Holy basil is a widely known herb in the family Lamiaceae. It is native to India and vastly cultivated throughout Southeast Asia. Tulsi has a special place in Ayurveda as well as the home of Hindus in India. It is considered sacred by Hindus and worshipped by them. Three main types of Tulsi are seen growing in India:

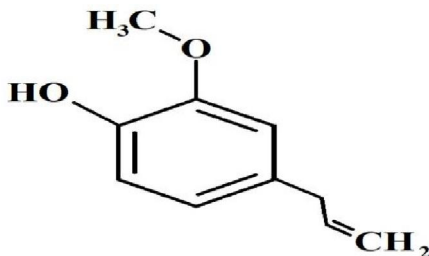
Bright green leaves called Ram Tulsi

Purplish green leaves called Krishna Tulsi

Common wild Vana Tulsi.

CHEMICAL COMPOSITION OF TULSI

Ocimum sanctum (holy basil) contains various phytochemicals that contribute to its medicinal properties. Here are some of the major phytochemicals found in holybasil:



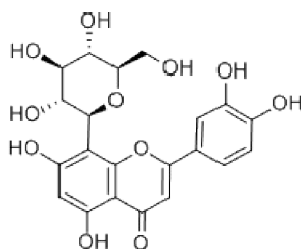
Essential oils:

Eugenol: the main component of holy basil oil, with antimicrobial, anti-inflammatory, and analgesic properties

Methyl chavicol: another major component of holy basil oil, with antifungal and antibacterial properties

1,8-Cineole: a minor component of holy basil oil, with expectorant and bronchodilator properties

Flavonoids:

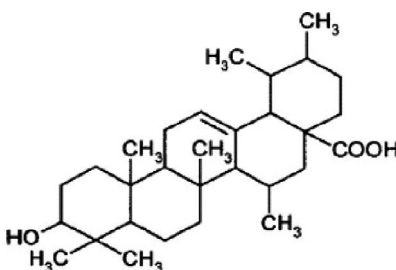


Orientin and vicenin: two major flavonoids found in holy basil, with antioxidant and anti-inflammatory properties

Apigenin: a flavonoid with anti-inflammatory and anti-cancer properties

Rosmarinic acid: a phenolic compound with antioxidant, anti-inflammatory, and anti-cancer properties.

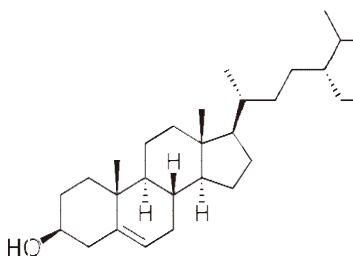
Triterpenoids:



Ursolic acid: a triterpenoid with anti-inflammatory, antioxidant, and anti-cancer properties

Oleanolic acid: a triterpenoid with anti-inflammatory and anti-cancer properties

Other phytochemicals:



Beta-sitosterol: a phytosterol with cholesterol-lowering and anti-inflammatory properties

Camphor: a ketone with analgesic and anti-inflammatory properties

Carvacrol: a monoterpene with antimicrobial, anti-inflammatory, and antioxidant properties.

Eugenol: the main component of holy basil oil, with antimicrobial, anti-inflammatory, and analgesic properties

GINGER:



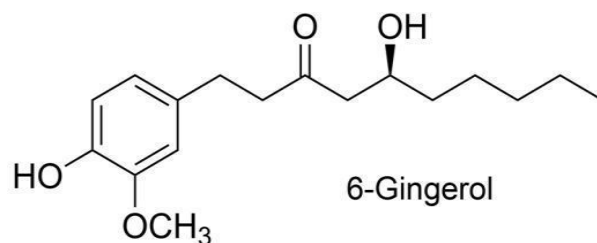
Fig 2 : Ginger

Synonyms: Rhizoma zingiberis, Zingibere

Biological Source: Ginger consists of the dried rhizomes of the *Zingiber officinale* Roscoe, belonging to family Zingiberaceae.

Chemical Constituent: Volatile oil is composed of sesquiterpene hydrocarbon like α -zingiberol; α -sesquiterpene alcohol α -bisabolene, α -farnesene, α -sesquiphellandrene. Less pungent components like gingerone and shogaol are also present.

STRUCTURE OF GINGER:



Uses:

Ginger can help to prevent cavities and remove plaque. Ginger can strengthen the gum around the teeth.

It is also used as remedies, for painful affections of the stomach, cold, cough, and asthma. Sore throat, hoarseness, and loss of voice are benefited by chewing a piece of ginger.

JAGGERY:



Fig 3: Jaggery

Jaggery is a traditional non-centrifugal cane sugar consumed in the Indian Subcontinent, Southeast Asia, and Africa. It is a concentrated product of cane juice and often date or palm sap without separation of the molasses and crystals and can vary from golden brown to dark brown in color. It contains up to 50% sucrose, up to 20% invert sugars, and up to 20% moisture, with the remainder made up of other insoluble matter, such as wood ash, proteins, and bagasse fibers. Jaggery is very similar to muscovado, an important sweetener in Portuguese, British and French cuisine. The Kenyan Sukari ngutu/nguru has no fibre; it is dark and is made from sugar cane and sometimes extracted from palm tree.

HONEY:



Fig 4 : Honey

Honey is a sweet and viscous substance made by several bees, the best-known of which are honeybees. Honey is made and stored to nourish bee colonies. Bees produce honey by gathering and then refining the sugary secretions of plants (primarily floral nectar) or the secretions of other insects, like the honeydew of aphids. This refinement takes place both within individual bees, through regurgitation and enzymatic activity, as well as during storage in the hive, through water evaporation that concentrates the honey's sugars until it is thick and viscous.

CHOCOLATE BASE:



Fig 5 : Chocolate Base

Chocolate liquor, sometimes referred to as unsweetened chocolate, is the base of all types of chocolate. This thick, dark brown paste is created from cacao nibs, the inside of the cocoa bean. The nibs are finely ground to a smooth texture. When heated, this paste turns to a liquid that can be formed into bars or chips.

PHARMACOLOGICAL ACTIVITY OF TULSI

Ocimum sanctum (holy basil) has been extensively studied for its pharmacological activities. Here are some of the major pharmacological activities associated with holy basil:

Antioxidant activity: Holy basil is rich in antioxidants, including flavonoids and triterpenoids, which scavenge free radicals and protect cells from oxidative damage.

- **Anti-inflammatory activity:** Holy basil has been shown to have anti-inflammatory effects by inhibiting the production of inflammatory cytokines and enzymes, such as COX-2 and iNOS.
- **Antimicrobial activity:** Holy basil has broad-spectrum antimicrobial activity against bacteria, fungi, and viruses, including antibiotic-resistant strains.
- **Anticancer activity:** Holy basil has been found to have anticancer effects by inducing apoptosis (programmed cell death) in cancer cells and inhibiting tumor growth.
- **Cardiovascular activity:** Holy basil has been shown to have cardioprotective effects by reducing blood pressure, improving lipid profiles, and reducing the risk of atherosclerosis

II. MATERIALS AND METHODS

Collection and authentication of raw materials that is herbs that are to be involved in preparation they are tulsi, ginger, Jaggery and honey are added in required quantity. The mentioned plant leaves were collected from the herbal garden which is located in the premises of HSBPVT GOI Faculty of pharmacy Kashti Ahmednagar Maharashtra. These plants were authenticated by Pansare medicinal plant board Kashti Ahmednagar. This study was performed to expedite a new formulation and evaluation of a herbal lozenges of both types hard and soft lozenges were developed to know there effectiveness against the minor throat problems.

1) PREPARATION OF HERBAL LOZENGES:

- o Fresh juice of plant leaf is extracted.
- o Both soft and hard lozenges are formed in moulds.

2) EVALUATION OF HERBAL LOZENGES:

Physic chemical properties such as diameter, weight variation, thickness, disintegration, hardness, determination of moisture content, friability, PH.