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**Review Article**

## **Comparative Analysis Of Herbal And Non Herbal Lozenges**

**Swetha Yoganandan<sup>a</sup>, Gururaj S. Kulkarni<sup>a\*</sup>, Padmaa M. Paarakh<sup>b</sup>, Surinder Kaur<sup>a</sup>,  
A. Muthukumar<sup>c</sup>**

<sup>a</sup>Department of Pharmaceutics, The Oxford College of Pharmacy, Bangalore, Karnataka, India.

<sup>b</sup>Department of Pharmacognosy, The Oxford College of Pharmacy, Bangalore, Karnataka, India.

<sup>c</sup>Department of Pharmacology, The Oxford College of Pharmacy, Bangalore, Karnataka, India.

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### ABSTRACT

One of the most common and superior unique dosage forms and oral candy products are lozenges. Since the 20th century, lozenges have been employed and are now manufactured economically. As an innovative method to administer medicines with both systemic and local reactions in the oral cavity, lozenges have a bright future. The lozenges are meant to be sucked and held in the mouth or pharynx. These include solid medicated, flavored, and sweetened base dose forms. The therapeutic lozenges offer the bonus of extending the dosage form's period of retention in the oral cavity, which improves bioavailability, reduces discomfort in the stomach, and reduces first-pass metabolism. The alteration eliminates the first pass metabolism and reduces stomach pain. These reviews offer examples of multiple herbal and synthetic lozenges collectively with their confirmed information and a lot encouraged products. This review include introduction, advantages, disadvantages, types and marketed products of the study.

### INTRODUCTION

The French term "losenge," which refers to a diamond-shaped geometric with four equal sides, is from where the name "losenge" comes. Developed in the pharmaceutical industry throughout the 20th century, pastilles and lozenges are currently produced for retail sales. Lozenges are combinations containing solid substances that are intended to dissolve in the mouth or throat.

They can be used to treat systemic drug

**\*Corresponding Author:** Gururaj S. Kulkarnia

**Address:** Department of Pharmaceutics, The Oxford College of Pharmacy, Bangalore, Karnataka, India.

**Email** ✉: [skguru2006@gmail.com](mailto:skguru2006@gmail.com)

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absorption, swallowing difficulties, throat infections, and local pain. They might include one or more drugs in the form of flavoring and sweetener. They can deliver medications in a variety of ways to the oral cavity's mucosal surface. When taken orally, lozenges are a more inventive and efficient dosage form. Lozenges were commonly used in the past for managing moderate sore throat irritation and pain, as well as



for applying topical anesthetics and antibacterial drugs. Lozenges nowadays comprise several different pharmaceutical categories, which include painkillers, anesthesia drugs, antimicrobial agents, antibiotics, antitussives, demulcents, astringent substances, medications for congestion, and other pharmacologic forms of combinations.(1) Its sweet, sugary elements are used to cure throat infections and mouth discomfort. It can also be used to help medications absorb more efficiently. Lozenges provide a systemic effect if the medication is swallowed or absorbed through the buccal linings. Lozenges are placed in the oral cavity. Due to their size, buccal lozenges are intended to be inserted and are well-formed frequently used because of the tongue's lower extremities which may get irritated. Patients who are unable to take solid oral forms of medications or pharmaceuticals drugs which are prescribed by lozenges released gradually to create a steady dosage of the medication in the mouth or to gradually take care of the tissue in the throat with a medication solution. These are the medications that are typically found in lozenges. Since the lozenge can also be used to administer various other drugs. Depending on the requirements of an individual patients. As over-the-counter (OTC) medications, a range of lozenges are accessible without a prescription. While some drugs are given by a doctor, others need a prescription. A lozenge is a solid dose form that normally includes a flavoring ingredient in addition to a pharmaceutical medication. Lozenges, additionally known as torch or pastilles, are designed to melt slightly in the mouth or pharynx resulting in an effect that can be localized or systemic. (2) Cough drops, also known as troche, cachou, or cough sweets which are little, therapeutic drugs that are meant to dissolve gradually in the mouth in order to immediately stop coughing soothe and lubricate the tissues that

are infected of the throat infections (sore throat) through the flu or the cold.(3)

### **FORMULAS FOR LOZENGES**

The goal of the lozenges is provide a more feasible way for administration and to formulate into a stable dose form of various medications.

Lozenge formulation requirements include

1. Identifying a proper medication candidate.
2. Identifying the proper drug carrier excipients.
3. Identifying the proper kind of lozenge formulation.(4)(5)(6)

### **ADVANTAGES**

- It is easy to administer to both the pediatric and geriatric populations.
- It can be given to patients who have trouble swallowing.
- It prolongs the duration of the medicine in the mouth to produce a specific outcome.
- It is simple to create, requiring little time or equipment. It does not require the administration of a water intake form.
- Drugs may be absorbed systemically through the buccal cavity.
- The inclusion of sweeteners and flavors in the formulation can hide the taste of the medications.
- The method is non-invasive, similar to parenterals.
- It may enhance bioavailability.
- It can lower the frequency of dose.
- It could reduce gastrointestinal discomfort.
- It may enhance the onset of activity.
- It is able to avoid the first pass metabolism.
- Enhanced compliance from patients.(7)

### **DISADVANTAGES**

- Certain medications such benzocaine, might not mix well with aldehyde confectionery bases.
- Lozenges can be used safely by children greater than six.



- Likely medication leakage from the oral cavity into the stomach, along with saliva.
- Children may unintentionally mistake the lozenge dosage form for candy.
- The high temperature needed to prepare them is a hard candy lozenge.
- Grainy lozenges become hard.(8)

## TYPES OF LOZENGES

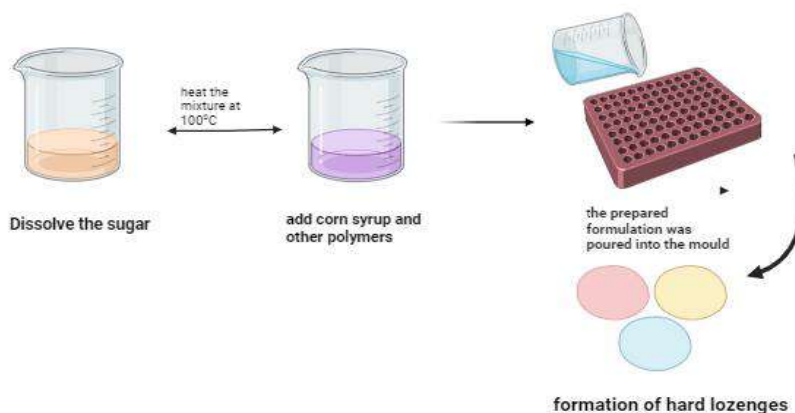
### Hard lozenges

A combination of sugar and other calories in a cloudy or opaque state brings up hard candy lozenges. Hard lozenges generally have a moisture level of 0.5 to 1.5%. They should not break down, have a smooth surface texture, a pleasant flavor which hides the taste of the medical treatment, and a slow, uniform melting or erosion over 5 to 10 minutes. Lozenges of hard candy usually have an

approximate weight of 1.5 to 4.5 grams. Graining tendencies decrease whenever corn syrup solids are added in quantities above 50%, which enhances product stickiness and interactions with medicines. Graining tendencies and crystallization frequency tend to increase when using more than 70% sucrose solids. A figure 1 represents hard lozenges (9)



Method of preparation of hard lozenges



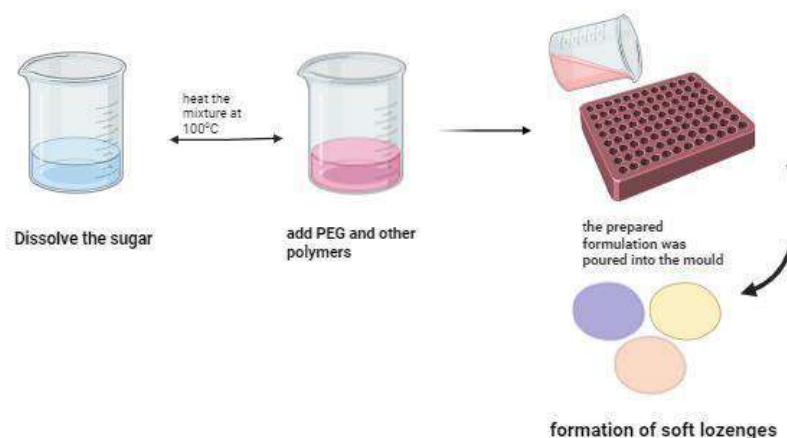
### Soft lozenges

The minimal effort by which soft lozenges may be rapidly made and used on an array of medicines has resulted in their growing popularity. Usually, a blend of a number of polyethylene glycols as well as acacia materials serve as the basis. They have similarity to a previous era of medicines that are currently undergoing a renaissance: candy,

which are soft, richly sugared masses containing medicinal components, are recognized as so. Lozenges comprised of polyethylene glycol might turn softer in extreme temperatures. It's best maintained in an area that is cool and dry. An example of soft lozenges is mentioned in figure 2.

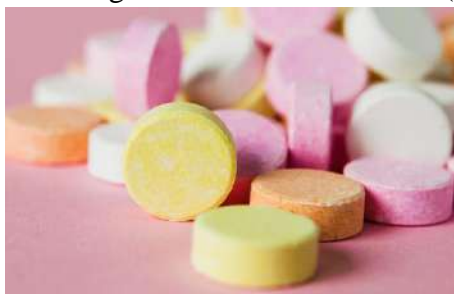


### Method of preparation of soft lozenges



### Chewable lozenges

There have been soft, chewable candies available for some time now. They have a strong taste and often possess a mildly bitter feel. The gelatin base preparation, which is explained below, is the most complicated step. These are an excellent method to give medicines for systemic consumption and gastrointestinal absorption, as they are specifically suited for pediatric patients. A figure 3 represents chewable lozenges as mentioned below. (10)



**Figure 3**

### Method of preparation of chewable lozenges SYNTHETIC LOZENGES :

Numerous modern technologies have been produced to enhance the typical lozenge forms. In these developments include the implementation of new ingredients and manufacturing procedures to improve flavor, decrease caloric content, expedite manufacture, and improve drug release properties. The pharmaceutical lozenges have a benefit of prolonging the dosage form's duration of retention in the oral cavity, which enhances bioavailability, minimizes gastrointestinal discomfort, and reduces first-pass metabolism. Lozenges are increasing prominence because of their capability to maintain a mucosal layer of the nostrils moist, improve the swallowing reflex, and prolong the duration in time when the medicine is effective. Lozenges have two main effects: a localized one which arises at a specific location inside the salivary glands, and a broader one that occurs once, the medicine reaches the bloodstream and begins functioning chemically. Numerous multivitamin lozenges, vitamin C and D lozenges,

and nicotine-containing lozenges for giving up smoking contain B-complex. More recently, it has been demonstrated that lozenges with one or more components can be produced exclusively for

patients who are chronically ill, resulting in a patient-friendly dose form. (11)

### Method of preparation medicated lozenges



**Table 1- lists of synthetic marketed products**

Product	Active pharmaceutical Ingredient	Mechanism of action	Reference
Salbutamol sulphate lozenges	Corn syrup is combined with isomalt, a tooth-friendly sugar substitution.	60-minute extended release of medication profile	12
Ketoconazole lozenges	Hydroxypropyl methyl cellulose, hydroxy ethyl cellulose, sucrose, and citric acid	lowers intestinal discomfort by promoting first-pass metabolism	13
Paracetamol lozenges	Acetaminophen, Sodium Carboxymethyl Cellulose, and Sucrose	medication release gradually	14
Clotrimazole lozenges	Artificial coloring and scents, methyl cellulose, guar gum, acacia, acidic substances, and sucrose base	An extended amount of time invested in oral retention	15
Lozenges containing ondansetron hydrochloride	Sucrose serves as a base, and hydroxyl propyl methyl cellulose K4M, methyl cellulose, eudragit E100, and NaCMC act as binder.	increased bioavailability, faster start of action, and less pain in the stomach as the outcome of first pass metabolism	16
Hydrochlorided diphenhydramine	Sodium citrate, mannitol, sucrose, dextrose, & isomalt	Enhance bioavailability by delaying the drug's first pass hepatic metabolism.	17

Lozenges with fluconazole tablets	Acacia, gelatin as a binding agent, maize starch, HPMC, E50, sugar as the foundation	First Pass Causes Greater Bioavailability and Lower Discomfort in The Gastrointestinal Tract.	18
Albendazole lozenges, either soft and hard	Albendazole, methyl cellulose, sweeteners, dextrose, NaCMC, as well as sorbitol solution	For hard lozenges, the drug release percentage was 99.37% after 30 minutes, whereas for soft lozenges, it was 88.92% after 50 minutes.	19
Cefixime lozenges	PEG, xylitol, sorbitol, gelatin, glycerin, as well as citric acid	Enhance the beginning of the action irritation of the throat	20
Miconazole lozenge	PEG400, PEG6000, citric acid, as well as methylene chloride, HPMCK100M, HPMCE5,	a long-lasting buccal membrane fungus-related disease in elderly and young children	21
Domperidone chewing drops	menthol, amaranth, citric acid, sweeteners, even dextrose	Enhance the biodegradability	22

### HERBAL LOZENGES :

A herb is any kind of plant or section of a plant that is used for its flavor, aroma, or medicinal benefits. Herbal supplements are one category of dietary supplements. They can be found in solid form as fresh or dried plants, tablets, capsules, powders, teas, and extracts. It will also boost health. (23)

#### Herbal Preparation:

Herbs can be taken in a variety of ways, but the most popular ones are liquids that are consumed as herbal teas or plant extracts which may be diluted. Though they might be developed in a few different ways, herbal teas, also known as tisanes, are the liquid that is left behind after extracting herbs into water.

- Infusions are made by steeping hot water extracts of herbs like mint etc.
- Long-term boiling extracts known as decoctions which are typically made from tougher materials like bark or roots.
- The process of maceration includes infusing plants with high mucilage content like thyme or sage and cooled. Plants are chopped and put

to cold water so that it macerates. Following that, they are let to stand for seven to twelve hours, depending on the herb. Typically, macerates are left for ten hours. Herbal tinctures are stronger than herbal teas because they are alcoholic extracts of herbs.

- Typically, tinctures are produced by mixing the herb with either pure ethanol or a mixture of pure ethanol and water. An accomplished tincture has at least 25% (and frequently up to 90%) ethanol. Glycerin can be used to make non-alcoholic tinctures, although they cannot last as long and are considered to be less absorbed by the body than tinctures created with alcohol. Herbal liquor and elixirs are made from alcohol-infused herbal extracts, often containing 12–38% ethanol.
- Nebulizes, dry extracts, and liquid extracts are varieties of extracts. In comparison to tinctures, liquid extracts have a lower ethanol content. Usually, tinctures are generated using distillation under vacuum. Plant material that

has evaporated into a dry mass is referred to as a dry extract.

- Water is a polar solvent, consequently a tea will have plenty of polar ingredients. In contrast, oil is a non-polar solvent which can absorb non-polar substances. In between lies alcohol. Multiple plants are topically applied to the skin in different ways.
- Essential oil extracts, typically diluted in a carrier oil, can be administered topically. Many essential oils can either be too strong to be used topically or burn the skin when treated directly; these can be safely treated as topicals by diluting them with olive oil or another food-grade oil, like almond oil. Other types of

topical administration processes include salves, oils, balms, creams, and lotions. Most of topical uses involve extracting herbs into oil.

- Certain phytochemicals can be obtained from food-grade oil by immersing herbs in it for a few weeks to many months. After that, you can use this oil as is or incorporate it into salves, creams, lotions, or just apply it topically as an oil.
- This is how a lot of antibacterial salves, massage oils, and wound healing compounds are manufactured. As with aromatherapy, inhalation can be employed as a treatment method as mentioned in fig 4. (24)



**Table 2- list of herbal marketed product**

Product	Active pharmaceutical Ingredient	Mechanism of action	Reference
Lozenges in ginger and garlic	NaCMC, sweeteners, poly vinyl pyrrolidone, and sodium chloride	Taking lozenges for the good release matrix gentle, mask taste	25
Lozenges containing marshmallow root extract	Gum xanthane as a sticky foundation	For 30 minutes, prolong the disintegration duration while maintaining a 40% in vitro release rate for the lozenges.	26
Polyherbal lozenge, Joshanda	Joshanda with its natural decoction form	Prolonged duration of action, delayed breakdown in the mouth	27
Lozenges in catechu and liquorice	Liquid glucose, compounds of the licorice and black catechu, mixed with Galen IQ 990	Both medications operated in combination to produce a synergistic effect.	28
Lozenges containing a polyherbal extract base	Adhatodavasica, cordialatifolia,	Recommended dosage for relieving discomfort	29

	alpiniagalanga, viola odorata, glycyrrhizaglabra, piper longum, as well as hyssopusofficinalis		
Lozenges containing coleus aromaticus and eucalyptus oil	Lactose, mannitol, gelatin, sucrose, as well as magnesium stearate	Inhibitory effect against C. albicans infection which cannot be resistant	30

## CONCLUSION

Lozenges constitute a popular and effective dose form which delivers both local and systemic effects in the oral cavity. Since the 20th century, it's cheap manufacturing process has ensured their expansive availability. They provide a novel method to administer health care: they are held and sucked in the mouth or pharynx. Their solid bases that can be flavored, sweetened, and medicated make them suitable to a broad spectrum of uses. The further away benefit associated with therapeutic lozenges is its continued absorption in the oral cavity, that increases bioavailability and decreases inflammation and first-pass metabolism in the GI tract. This modification in the method in which the medication is given has a beneficial effect on patient comfort and medicine performance. Examples of both synthetic and herbal lozenges are provided in the review, complete with details on their various advantages for health, quality control methods, and selection criteria of flavoring agents. When everything is taken into account, the comprehensive examination of lozenges shows they possess the potential to serve as a preferred dosage form for a variety of medicines, including characteristics such reduced side effects, greater bioavailability, and easy access of administration.

## REFERENCES

1. Choursiya et.al, Review on Lozenges. *Journal of Drug Delivery & Therapeutics*. 2018; 8(6-A):124-128.
2. Gopale et al, Medicated Lozenges: A Review. *Asian Journal of Pharmaceutical Research and Development*. 2022; 10(2): 129-134.
3. Umashankar M S et al. Chewable Lozenge Formulation- A Review, *Int. Res. J. Pharm.* 2016, 7 (4).
4. Michaud J. *Pharmaceutical Confectionary*. Pharma Chem.Pharmaceuticals. 2002; 24-27 9.
5. H.A. Shojaei. Development of medicated Lozenges. *J Pharm Sci*. 1998; 1(1): 15-30
6. Peters D. Medicated lozenges. In: Lieberman HA, Lachman L, Schwartz JB editors. *Pharmaceutical Dosage Forms: Tablets*, 2nd . New York: Marcel Dekker, Inc. 2005: 419-577.
7. Apurva D. Pokale, Dr. Shrikantk, Tiloo And Dr M.M Bodhankar.Medicated Chewable Lozenges: A Review.*Ijrsr*.April 2019.Vol.10, Issue 04(G), Pp.32071-32076.
8. Rajesh Kini, Mahalaxmi Rathnanand, Deepak Kamath, Investigating the suitability of Isomalt and liquid glucose as sugar substitute in the formulation of Salbutamol sulfate hard candy lozenge. *J Chem Pharm Res*. 2011; 3(4): 69-75.
9. Madhusudan Rao Yamsani. Et Al. Lozenges Formulation And Evaluation: A Review, *Ijapr*. /May 2014/ Vol. 5 /Issue 5 /290 – 298.
10. Akhila G Et.Al, A Review: Poly Herbal Lozenges For Cold And Flu. *Ijprajournal* Volume 7, Issue 2 Mar-Apr 2022, pp: 549-555.
11. J F Firriolo. Oral cavity- A Review *Oral Surg Med Oral Pathol*. 1994; 78(2): 189-193.
12. Nagoba S.N et al., Study on candy based Ketoconazole Peadiatric Tablet Lozenges. *Int J Res Ayurveda Pharm* 2011; 2(1): 239-243



13. Pattanayak D, Das S. Formulation development and optimization of medicated Lozenges for pediatric use. *Int J Pharm Sci Res.* 2012; 3(1); 138-140.
14. Nagoba Shivappa N, Purushotham Rao K., Zakaullah S. Formulation of Clotrimazole as lozenges tablet for improved delivery to ORAL thrush. *Journal of Pharmaceutical and Biomedical Sciences*, 2011, 12 (17): 1-3.
15. Sunitha Reddy M et.al, Lozenges Formulation and Evaluation: A Review. *Ijprajournal*, Volume 6, Issue 6 Nov-Dec 2021; pp: 678-684.
16. Suchitra P., Abhay V., Formulation Development and Evaluation of Antiemetic Lozenges of Ondansetron Hydrochloride, *International Journal of Pharmaceutical Research and Bio-science*, 2014, 3(3); 365-372.
17. Dasharath P., Rahul P., Hardik S., Chhagan P., Formulation and Evaluation of Diphenhydramine Hydrochloride Lozenges for Treatment of Cough, *World Journal of Pharmacy and Pharmaceutical sciences*, 2014,3(5); 822-834.
18. Bharkad V. B., Formulation and Evaluation of Lozenges Tablet of Fluconazole, *Indo American Journal of Pharma Research*, 2015, 5(1); 354-363.
19. Neha D., Aparna C., Dr. Prathima S., Formulation and Evaluation of Medicated Lozenges of Albendazole for Pediatric use, *Asian Journal of Biochemical and Pharmaceutical Research*, 2015,3(5);202-215.
20. Kirti S., Dr. Sulekha B., Development of Cefixime Lozenges for Treatment of Throat Infection , *World Journal of Pharmacy and Pharmaceutical Science*, 2015,4(7); 645-656.
21. Shivprasad M., Vaibhav J., Development of Antifungal Lozenges for Treatment of Oropharyngeal Candidiasis, *Indo American Journal of Pharmaceutical Research*, 2015,5(1), 370-386.
22. Laxmi B., Swati G., Sravani P., Indira R., Shailaja P., Formulation and Evaluation of Domperidone Candy Lozenges , *World Journal of Pharmacy and Pharmaceutical science*, 2017, 6(12), 1167-1175.
23. Peters d. Medicated Lozenges. In: Lieberman HA, Lachman L, Schwartz JB, editors. *Pharmaceutical Dosage Forms: Tablets.* 2 nd ed. New York: Marcel Dekker, Inc.; 2005. p. 419-577.
24. Lozenges and Pastilles, Prolonged Medication From Palatable Preparations. *Royal Pharmaceutical Society, Information sheet*: 4.
25. Esimone CO., In-Vitro Antimicrobial Evaluation of Lozenges Containing Extract of Garlic and Ginger, *International Journal of Health Research*, 2010, 3(2), 105-110.
26. Bistra Kostova et.al, Development and Evaluation of Novel Lozenges Containing Marshmallow Root Extract, *Pak. J. Pharma. Sci.*, 2013, 26(6), 1103-1107.
27. Monika Bansal et al., Antibacterial, antitussive, antioxidant and toxicological evaluation of Joshanda lozenges, *Journal of Applied Pharmaceutical Science* Vol. 5 (07): 064-070.
28. Kesha D., Mitesh K., Dr. Ankur T., Dr. Ramesh G., Formulation Development and Evaluation of Herbal Lozenges for the Treatment of Recurrent Aphthous Stomatitis, *International Journal of Research in Pharmacology and Pharmacotherapeutics*, 2016, 5(4), 318-325.
29. Hina R., Aqib Z., Zeeshan S., Safila N., Khan U., Polyherbal Extract Based Linkus Lozenges for Symptomatic Relief: Design, Development and Evaluation, *American Journal of Advance Drug Delivery*, 2017, 5(1), 011-018.

30. Binu A., Irene T., Beena P., Eleesey A.,  
Formulation and Evaluation of Herbal  
Lozenges Containing Eucalyptus Oil and  
Coleus Aromaticus Oil, American Journal of  
Pharmatech Research, 2018, 8(1), 2249-3387.

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