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Preparation and Formulation of Hard Lozenges

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Abstract

It is used to treat the mouth and throat to slowly administer digestive or cough medicines. This medication is used to treat symptoms of excess stomach acid, such as heartburn, heartburn, and acid indigestion. It is also used to relieve symptoms of excess gas such as belching, bloating and pressure/discomfort in the stomach/intestines.

Types of lozenges –

- **Hard lozenges**
- **Soft lozenges**

The result is these lozenges reduce gas and stomach space and reduce acidity. Digestive system works properly in our body. These lozenges are one of the widely used dosage forms. The advantage of medical lozenges is that they increase the retention time of dosage forms in the oral cavity, which increases bioavailability, reduces the stomach.

Ingredients –

- Honey
- Jaggery
- Liquorice
- Cumine
- Turmeric
- Ginger
- Guduchi

● Tulsi extract The present review covers more or less aspects associated with lozenges and also throws light on the application of the lozenges .The polyherbal lozenges formulations developed to eliminate all symptoms of cold and flu. Although many herbal and allopathic drugs are available, but they are not sufficient to treat all the symptoms through one formulations.

● Keyword: Formulations, Lozenges, Moulding, Troches

1.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. No treatment is required. This means that the patient receives treatment without assistance. 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. If the patient suffers from malabsorption, where absorption from the small intestine is not guaranteed, he will not feel comfortable. Oral formulations are not suitable for drugs that are susceptible to GIT inactivation or destruction. For example, insulin is a protein that, when taken orally, is digested in the stomach just like proteins found in foods such as meat and fish. Sometimes the drug itself causes such problems with the GIT. Like aspirin and many anti-inflammatory drugs, repeated long-term use can cause stomach ulcers. Finally, absorption takes longer, which delays the onset of action.[1]Troms are solid preparations containing one or more substances in a usually salty, sweet base designed to slowly dissolve or disintegrate in the mouth.[2] ,[3] They can be made by moulding or compressing sugar-based tablets. The development of troches dates back to the 20th 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] Lozenges are of different types. (A) Nicotine tablets are used to help smokers quit smoking. It is a smoking cessation aid and provides low nicotine content. It can help you quit smoking by reducing withdrawal symptoms. Do not use nicotine in the following cases: 1) if you are allergic to the ingredients of nicotine tablets; 2) people who have recently had a heart attack. People with severe or worsening chest pain or severe arrhythmias. Certain medical conditions may interact with nicotine tablets. Acetaminophen, adrenaline antagonists (eg, prazosin), beta-blockers (eg, labetalol, propranolol), caffeine, insulin, oxazepam, pentazocine, theophylline, or tricyclic antidepressants (eg, imipramine) (B) Linctagon pastes and lozenges contain the active ingredient. Sidolyptusargonium. Provides support to relieve coughs, sore throats and inflammations. Good for diabetes.(C) Pastes are used to treat infections in or around the mouth, throat or tongue caused by a yeast called Candida. This condition is called candidiasis or thrush. The most common use of thrush is Candida albicans. (D) Flurbiprofen pastes: Flurbiprofen belongs to a group of anti-inflammatory drugs. These drugs are used to relieve pain and inflammation. Lozenges are

used to relieve the symptoms of a sore throat.(E) Low-dose natural human interferon-alpha lozenges are used to treat Behcet's syndrome. There is some evidence that low doses of topical IFN may be useful in the treatment of recurrent mouth ulcers.(F) Actiq lozenges: These lozenges contain the active ingredient fentanyl. Fentanyl is a type of drug called an opioid analgesic (pain reliever). Opioids are a group of highly effective pain relievers related to morphine. Opioids are given as pain relievers to people with long-term severe pain, such as pain caused by cancer. Even with these effective pain relievers, your pain may get worse. This is called "breaking pain". Actiq tablets are used to relieve this "breakthrough pain" in people who are already taking opioid pain relievers. This is called "breaking pain". Actiq tablets are used to relieve this "breakthrough pain" in people who are already taking opioid pain relievers. A troch consists of a dragon attached with edible glue for handling. The trochee is placed in the mouth next to the cheek and moved around the mouth using the handle. The drug is quickly absorbed into the blood through the mucous membrane inside the mouth, which quickly relieves pain. It is used to relieve breakout pain in people who regularly use opioid analgesics for long-term, persistent, and severe cancer pain. (G) Zinc Gluconate and Zinc Acetate Lozenges: As you know, zinc is an important mineral and antioxidant. in all somatic cells. It is important for many physiological functions and is an essential cofactor for more than 200 enzymes, more than any other mineral. Researchers have investigated the use of zinc as a way to treat or relieve the symptoms of the common cold. Research shows that taking zinc as syrup or lozenge in the first few days of a cold can shorten the duration of the illness. It also seemed to prevent colds in people who used it for about 5 months. Therefore, the research results on the use of zinc as a cold medicine are not conclusive so far. For every study that shows a positive effect on zinc, there is another study that shows no effect. Many experts say that if there is any benefit from taking zinc or a zinc tablet, it is very minimal. [6], [7]

What are lozenges

Definition: "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]

Types of lozenges: · Pastes of medicinal products. · Drug free lozenges.

Classification of lozenges: me According to the place of business:

a. Local effect - e.g. antiseptics, decongestants.

b. Systemic effect - e.g. vitamins, nicotine.

II. According to its composition and composition:

a. chewable - e.g. vitamins

b. hard - e.g**.** lollipops

c. soft- e.g. Bentasil3

d. **packed** e.g. Troches**.**

A. Chewable tablets: [3] Medicines in chewable tablets are contained in a caramel base, so instead of dissolving in the mouth, it is chewed. These lozenges are made or formulated with glycerine, gelatin and water. They are strongly flavoured with fruit and also have a slightly sour taste which is deliberately designed to mask the bitter taste of glycerine. Such lozenges are mainly intended for use by children, to obtain a drug intended for GIT absorption and systemic action. The glycerine base used in chewable tablets is quite similar to the base used for glycerine suppositories or gelatin gelatin suppositories. Which consists of 70% glycerine, 20% gelatin and 10% purified water.

B. HARD lozenges: This type of lozenge is a mixture of sugar and carbohydrates. They exist in non-crystalline forms, usually in an amorphous or glassy state. They are also called "sugar syrups". The weight of hard caramel tablets is 1.5-4.5 grams. The moisture content of these lozenges is 0.5-1.5%. These lozenges should directly dissolve instead of disintegrating, but they require high temperatures to make, so a heat-sensitive substance or ingredient cannot be made. Hard lozenges are widely used to treat sore throats or various throat infections, as well as to relieve irritation by administering a local anaesthetic or antibiotic drug**.**

C. Soft lozenges: Soft lozenges are designed to release the medication slowly into the mouth and are made using ingredients such as PEG (polyethylene glycol), chocolate or acacia-based. Some soft lozenges also contain silica gel at the bottom, acacia is the main ingredient of these lozenges. smoothness and texture. PEG-based lozenges soften at high temperatures and are also hygroscopic, so it is recommended to store them in a cool, dry place.

D. COMPRESSED PLANT CHAIN:4 Heat-sensitive ingredients, i.e. heat sensitive ingredients, cannot be formulated in the same way as soft lozenges, hard lozenges. A simple compression method can be applied to this type of ingredients, just like a compressed tablet. The only difference between them is the non-dissolving and slower dissolution profile. Pressed lozenges use the granulation method.

● **Advantages**

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 side effects: Because they are made with natural ingredients, herbal lozenges may have fewer side effects compared to traditional medicines.

Easy to use: Herbal lozenges are easy to use, as they can be taken orally and do not require any special equipment or preparation.

Available over-the-counter: Many herbal lozenges are available over-the-counter, which makes them easily accessible.

● **Disadvantages:**

Limited scientific evidence: While some herbs used in herbal lozenges have been studied frothier medicinal properties, more research is needed to fully understand their effectiveness and potential side effects.

Not regulated: Herbal lozenges are not regulated by the FDA in the same way that traditional medicines are, which means there may be inconsistencies in the quality and potency of the products. Allergic reactions: Some people may be allergic to certain herbs used in herbal lozenges, which could lead to allergic reactions.

Interactions with medications: Some herbs used in herbal lozenges may interact with prescription medications, which could lead to adverse reactions.

May not be suitable for everyone: Herbal lozenges may not be suitable for everyone, such as pregnant or breastfeeding women, or people with certain medical conditions. It is important to talk to a healthcare provider before using herbal lozenges. Herbal lozenges are a type of lozenge that contains natural ingredients that are believed to have medicinal properties.

Here are some common types of herbal lozenges:

Echinacea lozenges: Echinacea is an herb that is believed to support the immune system and reduce the severity of colds and flu. Echinacea lozenges may be5 formulated with other herbs or vitamins to boost their effectiveness (3).

Thyme pastes: Thyme is a natural antiseptic and is believed to be effective in reducing coughs and promoting respiratory health. Thyme pastes can relieve sore throats and reduce coughs. When choosing herbal pills, it's important to consider the specific health benefits you're looking for and the composition you want (4). It is also important to read the label carefully to ensure a quality product that contains the herbs and active ingredients you are looking for. Lozenges are a type of medicine or candy designed to slowly dissolve in the mouth. They come in many flavours, shapes and sizes.

Throat lozenges: These lozenges are designed to relieve sore throats and reduce coughs. They often contain ingredients such as menthol, eucalyptus, honey or lemon.

Zinc lozenges: These lozenges are believed to strengthen the immune system and shorten the duration of colds. They usually contain zinc gluconate or zinc acetate.

Vitamin C lozenges: These lozenges are formulated with a high dose of vitamin C, which is thought to support the immune system and reduce the severity of colds. Herbal tablets: These lozenges contain natural ingredients such as chamomile. , Echinacea or ginger, which is believed to have soothing or healing properties.

Nicotine Lozenges: These lozenges are used to quit smoking. They provide a small dose of nicotine to reduce cravings and withdrawal symptoms.

CBD lozenges: These lozenges contain cannabidiol (CBD), a non-psychoactive compound found in hemp. They are used to relieve pain, reduce anxiety or relax. Breath fresheners: These lozenges are designed to freshen breath and mask unpleasant odours. They often contain mint, cinnamon or other spices.

PURPOSES ● Objective Herbal tablets are designed to provide a variety of health benefits in the form of a small tablet that slowly dissolves in the mouth. The purpose of herbal tablets is to deliver herbal active ingredients directly to the throat, mouth and respiratory tract to relieve various ailments (15). Herbal pills can be made from a variety of herbs and natural ingredients, each of which can have different medicinal properties. For example, some herbal lozenges may contain herbs to help relieve a sore throat or cough, while others may be designed to boost the immune system or provide relaxation (6, 4). Herbs and ingredients used in their preparation. However, some of the common purposes of herbal tablets can be: ● 1. Relief of symptoms of cough and sore throat 6

● 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. It is important to note that herbal tablets are not intended to replace medical treatment or diagnosis and people should consult a doctor before using them to treat a medical condition

A. classification of lozenges-:

1. According to the place of action: lozenges can be classified in different categories based on different methods, for example, according to the place of action, which can be either local or systemic. Local effects are examples of preservatives, decongestants and vitamins, and nicotine are examples of systemic effects.

2. In terms of structure and composition: 2.1 Chewable or chewable medicines -: Soft and chewable sweets have been on the market for years. They are very tasty and often contain a slightly sour taste. They are a great way to deliver drugs; One of the most popular lozenges for children is the chewable tablet or "gum" sweet tablet. The gelatin base of these chewable tablets is similar to the previous glycerine suppositories or glycerine-derived gelatin suppositories, which were composed of 70% glycerine, 20% gelatin, and 10% purified water. Some of the earlier lozenges consisted of a gelatin or glycerogelatin base. These gelatin-based lozenges were made by pouring the melt into molds or sheets of uniform thickness. The dosage form was then "stamped" with differently shaped dies.

A final step is often added Advantages:

• **Natural ingredients**: Herbal tablets are made from natural ingredients, which mean they do not contain synthetic chemicals or artificial additives. Potential effectiveness: Some of the herbs used in herbal tablets have been shown to have healing properties that can help relieve pain. . Throats reduces cough and boosts a general sense of well-being.

• **Fewer side effects:** Because they are made from natural ingredients, herbal tablets may have fewer side effects than traditional drugs.

• **Easy to use:** Herbal tablets are easy to use because they can. should be taken orally and does not require special equipment or preparation

• **Available over the counter:** many herbal lozenges are available over the counter, making them readily available Cons:

• **Limited scientific evidence:** although some herbs used in herbal medicine have been studied for their medicinal properties. , more research is needed to fully understand their effectiveness and potential side effects.

•**Not regulated:** The FDA does not regulate herbal pills in the same way as traditional medicines, which means that incompatibilities can occur. product quality and efficacy.

•**Allergic reactions:** Some people may be allergic to certain herbs used in herbal tablets, which can cause allergic reactions.

•**Drug interactions:** Some herbs used in herbal tablets may interact with prescription drugs. can cause adverse effects.

•**Not suitable for everyone:** Herbal tablets may not be suitable for everyone, such as pregnant or lactating women or people with certain diseases. It is important to talk to your doctor before using herbal lozenges. Herbal lilies are lozenges that contain natural ingredients believed to have medicinal properties. Here are some common herbal tablets: Echinacea lozenges: Echinacea is an herb believed to support the immune system and reduce the severity of colds and flu. Echinacea lozenges can be made with other herbs or vitamins to increase their effectiveness

(3). Ginger lozenges: Ginger is a natural anti-inflammatory and is believed to be effective in reducing nausea and promoting digestion. Ginger pastes can be used to relieve sore throats and promote general well-being

INGREDIENTS:

1. **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]

2. **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]

3. **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. purposes for medicine.[27]

4. **Ginger:** Ginger is Zingiberofficinale. 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]

5. **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]

6. **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]

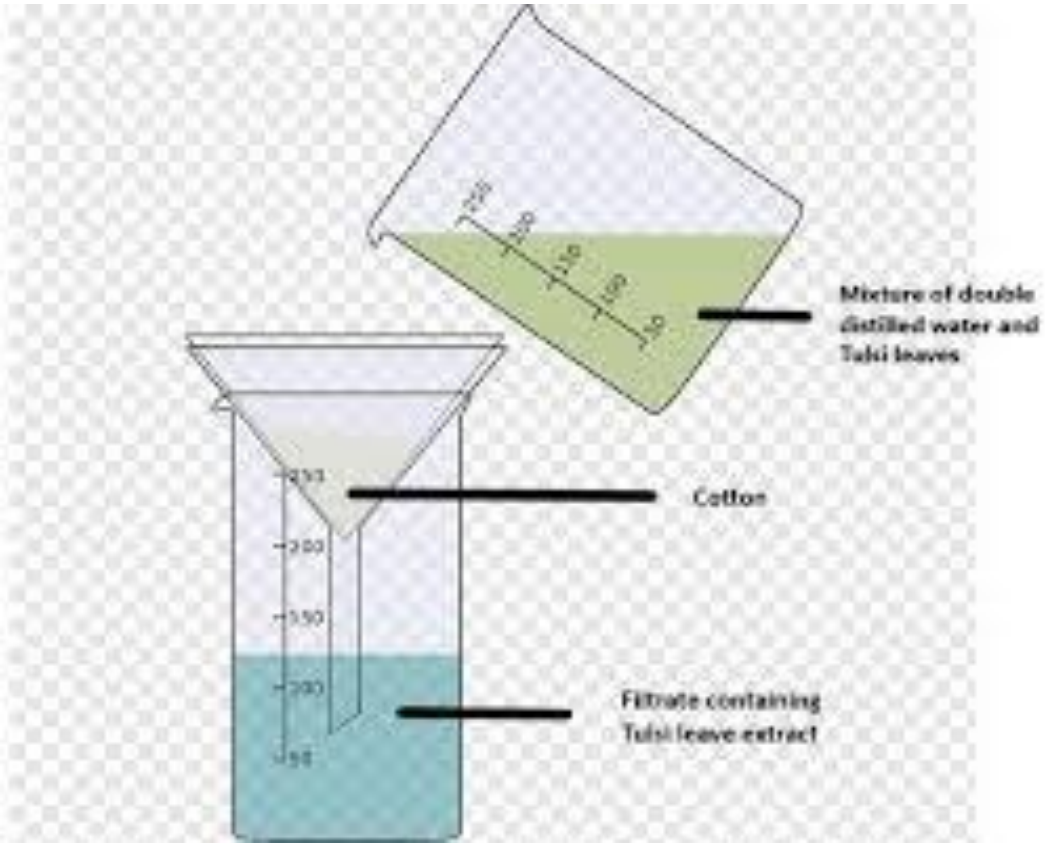
7. **Tulsi:** Also known as holy basil, Tulsi has long been employed in Ayurvedic medicine for its range of therapeutic advantages.[32] It is a common component in herbal cough medicines due to its anti-inflammatory, anti-bacterial, and anti-viral effects. colds as well as other respiratory conditions.

8. **Cumin:** A blooming plant of the Apiaceae family that is indigenous to the Irano-Turanian Region is called cuminum cyminum.[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 –

1. 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.

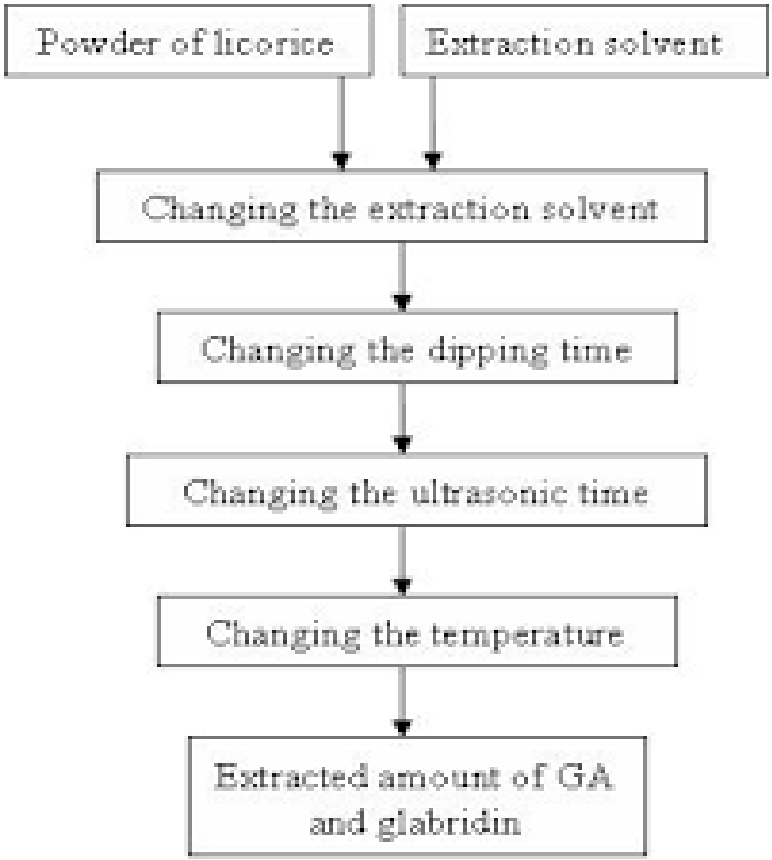


2. Guduchi - Tinospora cordifolia

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

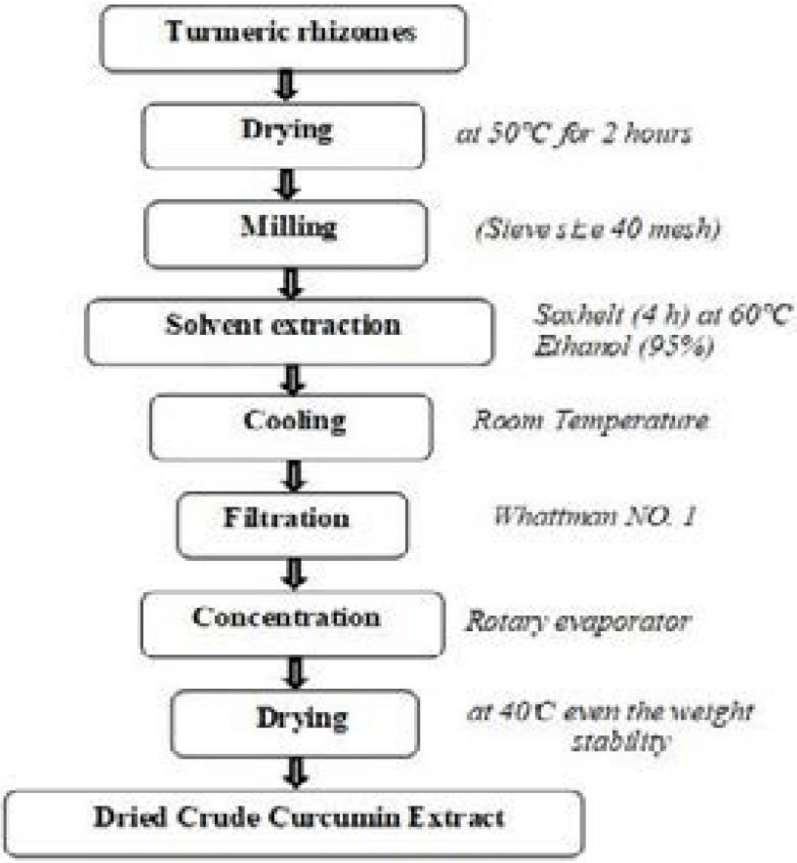
3. Liquorice -

In this study, a simple and convenient method for the extraction of glycyrrhizic acid and glabridin from licorice 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.



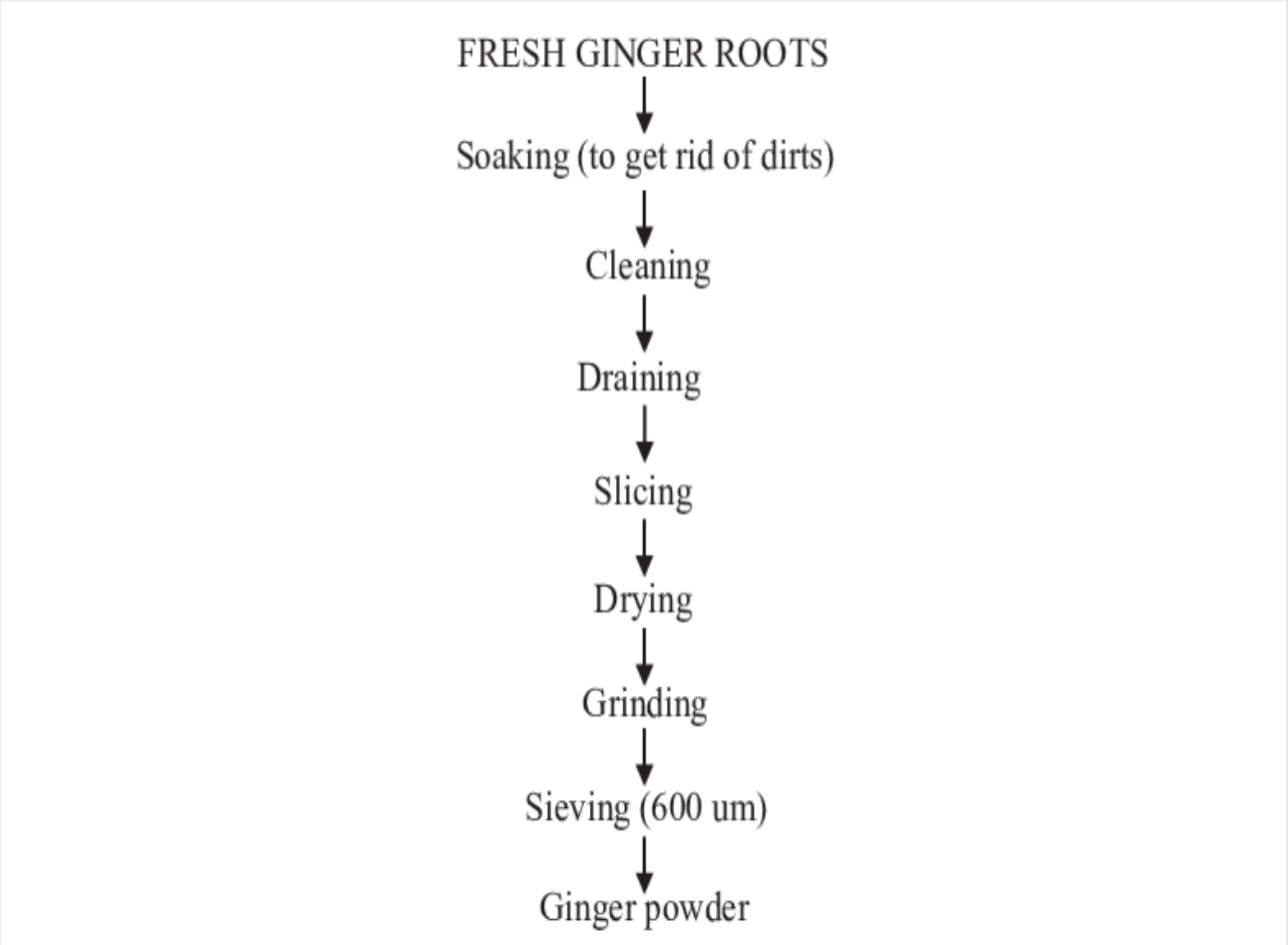
4. Turmeric -

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



5. Ginger –

The dried steamed ginger is baked for 3 hours to 5 hours at a temperature of 20 ° C. to 150 ° C. 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. **Macroscopical evaluation-:**

Sr.No	Parameter	Observation
1	Colour	Golden brown
2	Odour	Pleasant
3	Taste	Sweet
4	Texture	Smooth
5	Shape	Round

2. **Infra-red spectroscopy-:**

The IR spectroscopy theory utilizes the concept that molecules tend to absorb specific frequencies of light that are characteristic of the corresponding structure of the molecules. The energies are reliant on the shape of the molecular surfaces, the associated vibronic coupling, and the mass corresponding to the atoms.[35]

3. Ash Value -:

Ash value is useful in determining authenticity and purity of sample and also these values are important qualitative standards.[29] Weigh accurately about 3 gm of the powdered drug in silica crucible. Incinerate the powdered drug by increasing the heat gradually until the sample was free from carbon and cool it keep it in a desiccators. Weigh the ash and calculate the percentage of total ash in contrast to the air dried sample[36]

4. Moisture content-:

We take some lozenges and weighed it on electronic balance. The weight found is 4.530mg. Then we placed it in a porcelain dish. The dish was then placed in a desiccator under observation for around 24 hours. Again lozenges weighed on the balance and weight was found to be 4.135mg. The weight was found to be reduced, it means that the excessive moisture was removed from the lozenges.[37]

5. Dissolution Test -:

Medium: 0.1N hydrochloric acid; 900 ml. Apparatus: First Observation - After 15 min. Second Observation - After 30 min. Third Observation - After 45 min. Total time - 60 minutes. We setup four flask, two of standard and two of sample in 900 ml of 0.1 N HCL. The apparatus was set at 370C at 50rpm. The first observation was taken after 15 mins. And the second, was after 45mins. After completing 60 mins, sample was completely dissolved in 0.1 N HCL[38]

6. UV-Visible Spectroscopy-:

UV-Visible spectrophotometric analysis provides both qualitative and quantitative standards.[39] But markers are needed for quantitative analysis. An attempt is made to study UV-Visible Spectrophotometric analysis of some herbal products for understanding qualitative and quantitative parameters without markers.[35] We dissolved sample in 0.1 N HCL and then taken it into cuvette. Placed it into UV-Visible spectrophotometer and graph was obtained for sample, standard and blank.[40]

Conclusion

From the above investigations it can be concluded that lozenges can be prepared using Guduchi, Liquorice, Cumin, Tulsi, Turmeric, Honey and Jaggery

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