

Formulation and Evaluation of Herbal Syrup for Management of Acidity

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Abstract: *Acidity, also known as Amlapitta in Ayurveda, is a common problem in the stomach area where too much acid is produced. This can cause heartburn, a sour taste when you burp, feeling sick, and a burning pain in the upper abdomen. Using certain antacids for a long time can lead to side effects like constipation, imbalance in body chemicals, and even more acid production.*

In Ayurveda, natural remedies like Amla, Yasthimadhu, Saunf, and Guduchi are used because they help reduce acid, protect the stomach, prevent ulcers, and have a cooling effect. This study aims to create and test a herbal syrup that can safely and effectively manage acidity. Acidity, or Amlapitta, is a common stomach issue where the stomach makes too much acid. This leads to symptoms like heartburn, sour burps, feeling sick, trouble digesting food, and a burning feeling in the upper part of the stomach. Eating spicy food, not having regular meals, stress, and using strong medicines for too long can all make this problem worse.

When the fire of digestion (agni) in the stomach becomes unbalanced due to various reasons, it leads to Amlapitta. Common factors that can disrupt the digestive fire include skipping meals, eating between meals, worry, rushing while eating, and consuming spicy foods.

These factors can mess up the digestive enzymes and other substances in the stomach, causing a condition known as Amlapitta.

If the stomach makes too much or normal levels of hydrochloric acid it can damage the lining of the esophagus, stomach, and the first part of the small intestine. If this isn't treated, it can lead to ulcers.

Gastric acid, heartburn, sour belching, nausea, and pain in the upper stomach area are common symptoms of acidity. Using synthetic antacid for a long time can lead to problems like constipation, imbalance in body electrolytes, and increased acid production.

Herbal remedies like Amla, Yasthimadhu, Saunf, and Guduchi are commonly used in Ayurveda because they help neutralize acid, protect the stomach, prevent ulcers, and have cooling effects. This study is designed to create and test a herbal syrup that is both safe and effective for managing acidity.

Keywords: Formulation and Evaluation of Herbal Syrup for Management of Acidity

I. INTRODUCTION

Acidity, known as Amlapitta in Ayurveda, is a common stomach issue where too much acid is produced. This leads to symptoms such as heartburn, sour belching, nausea, indigestion, and discomfort in the upper stomach. The rise in cases of acidity is linked to factors like eating spicy food, not having regular meals, stress, and overuse of synthetic drugs.

Amla pitta happens when the digestive fire (agni) in the stomach becomes imbalanced. This imbalance can be caused by various habits and conditions, such as skipping meals, eating between meals, worrying, eating too quickly, or consuming spicy foods.



An ideal syrup should have good qualities like being clear, having the right thickness, staying stable, being the same throughout, and tasting and smelling pleasant. The pH level of the syrup needs to be controlled to keep the ingredients stable and work well together. Also, using proper methods in making the syrup is important to stop sugar from forming crystals and to prevent the active

Electrolyte imbalance and rebound acid hypersecretion are common issues, which has led to a greater need for safe and more effective treatments with fewer side effects.

Herbal medicines have been used for a lot for a long time to treat stomach cause they come from natural sources, are easier for patients to take, and are less harmful.

Herbs like Yasthimadhu (*Glycyrrhiza glabra*), Saunf (*Foeniculum vulgare*), Amla (*Emblca officinalis*), and Guduchi (*Tinospora cordifolia*) have been shown to help with reducing stomach ulcers, inflammation, fighting free radicals, and protecting. These herbs can help balance stomach acid, shield the stomach wall and improve digestion.

Syrup is a good form for treating acidity because it works quickly, is easy to take, and is more pleasant to drink, especially for people who have trouble swallowing tablets or capsules. The goal of this study is to make and test a herbal syrup using these selected plants to manage acidity, with a focus on its physical and chemical properties, how stable it is, and how well it neutralizes acid.

Amla helps to neutralize acid.

Yashtimadhu helps protect the stomach lining. Guduchi helps control inflammation and pitta. Saunf helps reduce gas and reflux.

Syrups are thick, sweet liquid medicines made mostly with sugar in water.

They can be either medicated, containing medicine, or nonmedicated. They are commonly used because they are easy to take, taste good, and can hide the bad taste of medicines.

In the pharmacy world, syrups are used to deliver medicine, especially for children and older adults who have trouble swallowing tablets or capsules.

The sugar in syrups not only makes them taste better but also helps keep them from getting spoiled by stopping the growth of bacteria through high sugar levels.

Syrups are usually divided into simple syrups, which are just sugar and water, and medicated syrups, which have active medicine.

In the case of herbal remedies, syrups are made by mixing plant extracts or boiled plant parts into a sugar base, often with flavoring, stabilizing, and preserving ingredients to make them more acceptable and longer-lasting

Electrolyte imbalance and rebound acid hypersecretion are common issues. Because of this, there's a growing need for safer and more effective treatments with fewer side effects.

Herbal medicines have been used for a long time to treat stomach problems.

They are natural, easier for patients to take, and have less harmful effects. Some herbs like Yasthimadhu (*Glycyrrhiza glabra*), Saunf (*Foeniculum vulgare*), Amla (*Emblca officinalis*), and Guduchi (*Tinospora cordifolia*) are known to help with ulcers, reduce inflammation, fight free radicals, and protect the stomach. These herbs can reduce too much stomach acid, protect the lining of the stomach, and improve digestion.

Syrup is a good form of medicine for managing acidity because it acts quickly, is easy to take, and tastes better, especially for people who have trouble swallowing tablets or capsules.

The main goal of this study is to create and test a herbal syrup using these plants to manage acidity. The study will look at the physical and chemical properties of the syrup, how stable it is, and how well it neutralizes acid.

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Syrups are thick, sweet liquids made mostly of sugar in water.

They can be either medicated or not and are widely used because of their good taste, ease of use, and ability to cover bad tastes.



In the pharmacy world, syrups are a good way to give medicine, especially to children and older adults who have trouble taking tablets or capsules.

The sugar in syrups not only makes them taste good but also helps prevent bacteria growth by making the environment too thick for microbes to survive.

Syrups can be simple, with just sugar and water, or medicated, with active ingredients.

In herbal medicine, syrups are made by mixing plant extracts or decoctions into a sugar base, along with flavoring, stabilizing, and preserving agents to make them more acceptable and longer-lasting.

An ideal syrup should have good qualities like being clear, having the right thickness, staying stable, being uniform in texture, and having a pleasant taste and smell. The PH. level of the syrup needs to be controlled to keep the ingredients stable and work well together. Also, it's important to use the right methods when making the syrup to stop sugar from forming crystals and to prevent the active ingredients from breaking down.

Herbal syrups are becoming more popular because they come from natural sources, have fewer side effects, and are compatible with traditional systems like Ayurveda.

They are effective in treating health problems and are easy to take, making them a good choice for managing issues like stomach problems such as acidity. Syrups are a flexible and easy-to-use form of medicine that play an important role in both standard and herbal medicine.

Herbal syrup is a preparation made by combining a concentrated herbal decoction with honey or sugar, sometimes with a little alcohol.

The base of the syrup is a strong herbal decoction, and adding sugar or honey helps to thicken it and keep it from going bad. Most herbal syrups come from plant-based medicine, which use extracts from fruits for their medicinal benefits. Other forms of herbal medicine are also made into syrups.

Types of herbal syrup:

1. Flavored syrup
2. Medicated syrup
3. Artificial syrup

Advantages of herbal syrup:

- No side effects
- Harmless
- Easily available
- Easy to adjust the dose based on a child's weight
- No need for help when taking it, so the patient can take it on their own
- Herbs grow in common places
- Acts as an antioxidant by slowing down oxidation as sugar turns cellulose and dextrose
- Good for patient compliance especially in children as syrups are sweet-tasting
- Acts as a preservative by slowing the growth of bacteria, fungi, and molds because of the high osmotic pressure.



DRUG PROFILE

Amla



Fig.1.2 Amla

Common name: Indian gooseberry, Amla

Biological name: *Phyllanthus emblica* (also known as *Emblica officinalis*)

Family: Phyllanthaceae

Part used: Fruit (fresh or dried), sometimes seeds and leaves

Chemical Constituents

Vitamin C (ascorbic acid) – very high amount

Tannins (emblicanin A & B)

Polyphenols (gallic acid, ellagic acid)

Flavonoids

Pectin

Pharmacological Actions

Antioxidant, Immunomodulatory, Anti-inflammatory, Antidiabetic, Hypolipidemic (reduces cholesterol),

Gastroprotective, Hepatoprotective

Therapeutic Uses

Helps improve immunity

Used in managing diabetes mellitus

Helps with hyperlipidemia

Improves digestion and treats acidity

Helps with cough, cold, and other respiratory problems

Promotes hair growth and prevents early greying

Supports liver health



Liquorice



Fig.1.3 Liquorice

Common name: liquorice, mulethi

Biological name: Glycyrrhiza glabra

Family: Fabaceae

Part used: Dried roots and stolons

Chemical Constituents

Glycyrrhizin (glycyrrhizic acid) – main active compound

Flavonoids (liquiritin, isoliquiritin)

Coumarins

Saponins

Polysaccharides

Pharmacological Actions

Anti-inflammatory

Demulcent (soothing effect on mucous membranes)

Expectorant

Antiulcer

Antiviral

Mild laxative

Corticosteroid-like activity

Therapeutic Uses

Useful in peptic ulcer and gastritis

Relieves cough, sore throat, and bronchitis

Used in asthma

Acts as a soothing agent in respiratory and GI disorders

Helps in Addison's disease (due to steroid-like effect)

Mild laxative in constipation



Guduchi (Giloy)



Fig. 1.4. Guduchi

Guduchi Common name: Giloy

Family: Menispermaceae

Biological Source: Guduchi comes from the fresh or dried stem of *Tinospora cordifolia*.

Chemical Constituents

Diterpenoid lactones (tinocordiside, tinosporaside)

Alkaloids (berberine-like compounds)

Glycosides

Steroids

Polysaccharides

Alkaloid magnoflorine

Uses

Immunomodulator (helps improve immunity)

Antipyretic (helps lower fever)

Anti-inflammatory

Antidiabetic

Hepatoprotective (helps protect the liver)

Used in Ayurveda for treating chronic fever, infections, and weakness

Ayurvedic Importance

It is called "Amrita," which means the nectar of immortality.

It is commonly used in Ayurvedic medicines like Guduchi satva.



Saunf



Fig.1.5 Saunf

Biological name: *Foeniculum vulgare*
Family: Apiaceae
Common names: Fennel, Saunf
Part used: Dried ripe fruits (commonly called seeds)

Chemical Constituents

Volatile oils (1–6%)
Anethole (major component)
Fenchone
Estragole
Flavonoids
Coumarins
Fixed oils

Pharmacological Actions

Carminative (relieves gas)
Antispasmodic
Digestive stimulant
Expectorant
Mild estrogenic effect
Antimicrobial



Therapeutic Uses
Indigestion, bloating, and flatulence
Infantile colic
Used in Dyspepsia
Improves appetite
Relieves cough and mild respiratory issues
Used as mouth freshener
Supports lactation in nursing mothers

Aim and Objective

Aim: To formulate and evaluate a herbal syrup for the management of acidity.

Objective:

- To choose suitable medicinal herbs that have proven anti-ulcer, antacid, and digestive properties for formulation.
- To prepare a stable polyherbal syrup formulation for managing acidity.
- To develop a standardized method for preparing the herbal syrup.
- To evaluate the physicochemical properties of the formulation, including pH, viscosity, clarity, stability, density, taste, and color.
- To assess the acid-neutralizing capacity of the formulation.
- To study the gastroprotective potential of the herbal syrup.
- To perform organoleptic evaluation, including appearance, odor, taste, and texture.
- To conduct stability studies of the formulation.
- To compare the formulation with commercially available antacid products.
- To validate the formulation as a safe, natural, and cost-effective alternative to synthetic antacids.
- To support traditional Ayurvedic knowledge through scientific evaluation.
- To develop a novel herbal formulation that is not commonly available in the market for acidity management.

PLAN OF WORK

Literature survey
Study of acidity, GERD, and ulcers
Review of herbal antacid drugs
Collection of pharmacological data on selected herbs
Collection and Authentication

Procurement of plant materials:

Amla fruits
Liquorice roots
Guduchi stem
Saunf seeds
Authentication from the botany department or herbarium

Preparation of Extracts:

Cleaning, drying, and powdering of plant materials
Extraction using suitable methods: decoction, aqueous extraction, or hydroalcoholic extraction
Filtration and concentration



Formulation of Herbal Syrup:
Preparation of simple syrup base (sucrose solution)
Incorporation of standardized herbal extracts
Addition of preservatives if needed (e.g., sodium benzoate)
Adjustment of pH and viscosity

Evaluation of Syrup:

Physicochemical Evaluation
Appearance (color, odor, taste)
pH measurement
Viscosity

Materials and Method

Amla: antioxidant, antiulcer
Liquorice: demulcent, antiulcer
Guduchi: anti-inflammatory, digestive support
Saunf: carminative, relief bloating
Sodium benzonate: preservative
Purified water: vehicle
Citric acid
Sucrose: sweetening agent

Formulation Table

Sr. No.	Ingredient	F1	F2	F3	Role in Formulation	Uses	Uses
1	Amla	20 ml	20ml	20ml	Active ingredient	Active ingredient	Active ingredient
2	Liquorice	8 ml	8ml	8ml	Active ingredient	Antinflammatory, Control pitta , Boosts Immunity	Anti-inflammatory, controls pitta, boosts immunity
3	Guduchi	10 ml	10ml	10ml	Active ingredient	Antinflammatory, control Pitta, Boost immunity	Anti-inflammatory, controls pitta, boosts immunity
4	Saumf	12 ml	12ml	12ml	Active ingredient	Carminative, relieve gas, Reduces bloating and Reflux	Carminative, relieves gas, reduces bloating and reflux
5	Sucrose	60 ml	60ml	60ml	Sweetening agent	Improve taste, Acts as preservative	Improves taste, acts as preservative
6	Sodium	0.05	0.05gm	0.05gm	Preservative	Prevent microbial	Prevents



	bezonate	gm				growth	microbial growth
7	Citric acid	0.1 gm	0.1gm	0.1gm	pH adjuster	Maintain PH, Enhances flavour	Maintains pH, enhances flavor
8	Purified water	q.s 60 ml	q.s60ml	q.s60ml	Vehicle	Solvent for Prepration	Solvent for preparation

MATERIALS AND METHOD

1.Preparation of Herbal Extracts

Each raw herb was washed, dried, and then ground into a rough powder.

The powdered herbs were boiled in water to make the extract (called decoction method):

Weigh the same amount (for example, 10 grams each).Put them into 200 mL of distilled water.Boil until the liquid is about a quarter of the original volume.Let the extract cool down and then pour it through a cloth or filter paper to remove solids .Combine all the filtered herbal liquids to make a mix of several herbs.

2.Preparation of Syrup Base

Mix sugar (60 to 70% of the total weight) into purified water, and heat it gently.Let the mixture cool down.Add some glycerin (5 to 10%) to make the syrup thicker and more stable.

3.Formulation of Herbal Syrup

Mix the herbal mix with the syrup base.Add a small amount of sodium benzoate (0.1%) to keep the syrup safe from bacteria.If needed, add more purified water to reach the right amount.Stir the mixture continuously to ensure it is smooth and even.Filter the final product and put it into dark-colored bottles to store.

4.Evaluation of Herbal Syrup

Organoleptic Evaluation

Check the color, smell, taste, and overall look.

Test the pH using a digital pH meter.

Measure the thickness (viscosity) with a viscometer.

Equipment

Electronic Weighing Balance

Hot Plate / Heating Mantle

Muslin Cloth / Filter Paper

Water Bath

pH Meter

Viscometer

Stoppered Glass Bottles / Amber Bottles

Procedure

Step 1: Prepare Herbal ExtractsTake dried powders of Amla, Guduchi, Saunf, and Liquorice.Use the decoction method:

Step 2: Add 100 ml of distilled water to the mixed powders.Boil for 15 to 20 minutes.Reduce the mixture to about 40 to 50 ml.Let it cool and then filter using a muslin cloth.Collect the clear liquid.



Step 2: Prepare Syrup Base Dissolve 40 grams of sugar in about 25 ml of distilled water. Heat gently until the sugar is completely dissolved. Filter if needed. Allow the mixture to cool.

Step 3: Mix Add the measured herbal extract to the sugar syrup slowly while stirring. Dissolve sodium benzoate in a small amount of water and then add it.

Step 4: Adjust Volume

Add distilled water to make the total volume 60 ml.

EVALUATION TESTS OF HERBAL SYRUP

1. Organoleptic Evaluation Colour : Brownish

Odour : Pleasant herbal

Taste : Sweet, slightly sour

Appearance : Brownish

2. Clarity



Fig.1.6 Clarity Test



3. PH



Fig.1.7 PH Determinations

3. Viscosity



Fig.1.8 Viscosity



Result and discussion

The herbal syrup was tested for different physical, chemical, and sensory characteristics, and the findings are as follows:

Colour: Brownish

Odour: Has a nice, natural smell like herbs

Taste: Sweet with a slight sour ending

Appearance: Clear and free of any small bits or particles

pH: Falls within a safe acidic level, making it safe to take by mouth

Viscosity: Has a moderate thickness, showing a good syrup consistency

Clarity: Transparent, showing it was properly filtered and has no unwanted substances

The syrup remained stable with no signs of settling, separating, or bacteria growth during the time it was observed.

Discussion

The study results show that the herbal syrup has good physical, chemical, and sensory qualities, making it suitable for oral use.

The brown color and pleasant smell come from the herbal ingredients, while the sweet taste, caused by sucrose, makes the syrup more enjoyable and easier for people to take regularly.

The pH level was kept in an ideal range, which helps the syrup stay stable and works well with the stomach environment.

The proper thickness makes it easy to pour and gives a consistent dose, which is important for liquid medicines.

Each ingredient in the syrup works together to help with the treatment: Amla is a natural antioxidant that helps reduce too much stomach acid. Yashtimadhu has soothing and ulcer-preventing properties, protecting the lining of the stomach.

SUMMARY

Hyperacidity (Amlapitta) is a common gastrointestinal disorder caused by excessive secretion of gastric acid, leading to symptoms such as heartburn, indigestion, nausea, and epigastric pain. Conventional antacids provide quick relief but are often associated with side effects on long-term use. Hence, there is a growing demand for safer, herbal alternatives.

The present study focuses on the formulation and evaluation of a herbal syrup for the management of acidity using traditional Ayurvedic drugs such as Yasthimadhu (*Glycyrrhiza glabra*), Amla (*Emblica officinalis*), Guduchi (*Tinospora cordifolia*), and Saunf (*Foeniculum vulgare*). These herbs are known for their antacid, gastro-protective, anti-ulcer, and soothing properties.

The herbal syrup is formulated using standard pharmaceutical procedures and evaluated for various parameters such as organoleptic characteristics, pH, viscosity, stability, and in-vitro antacid activity. The study aims to develop an effective, stable, and patient-friendly herbal formulation that can help neutralize excess gastric acid and provide relief from acidity with minimal side effects.

II. CONCLUSION

The study shows that the herbal syrup made with Amla, Yasthimadhu, Guduchi, and Saunf has a lot of promise for treating acidity.

These natural ingredients have been proven to help reduce stomach acid, protect the stomach lining, prevent ulcers, and improve digestion. All of these effects help ease symptoms like heartburn, difficulty in digestion, and pain in the upper abdomen. The syrup was found to be stable, tasty, and meets standard quality checks. Since it is made from natural herbs, it is a safer and more affordable option compared to man-made antacids, and it causes fewer side effects. Therefore, this herbal syrup could be a good and hopeful treatment for acidity, and more research and development could help bring it to market.



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