

## “Formulation and Evaluation of Extracted Herbal Syrup for Various Applications”

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**ABSTRACT:** High cholesterol levels in the body is the most common problem in worldwide. It is gradually increased and causes many more cardiovascular disorders. Ginger and garlic both are the most widely used spices in the Indian kitchen. Both work as the best herbal medicines for cancer, cough, antibiotics, anti-fungal, anti-atherosclerosis disorder, inhibit platelet aggregation and many more. But due to their astringent taste, direct consumables is very low. The syrup is for making them easily consumables. It contains ginger, garlic, honey base, and apple cider vinegar. The quality of the final herbal syrup was evaluated by post formulation parameter.

**KEYWORDS:** Syrup, Herbal syrup, Formulation, Ginger, Garlic, Lemon, Apple cider vinegar, Honey, Evaluation

### I. INTRODUCTION

Plants have been used as healing agents since ancient times, both in organized systems like Ayurveda and Yunani, as well as in unorganized forms such as folk, tribal, and native practices.[1] Many developing countries rely on both conventional medicine and medicinal plants to help maintain good health.[2] The development of reliable standardization tools for traditional medicines is necessary.[3] Blood lipid levels are influenced by lifestyle, diet, smoking, body mass index (BMI), waist circumference, physical activity, sex, and age.[4,5]

A healthy diet and natural foods play a crucial role in the prevention and sometimes the treatment of diseases. Ginger and garlic can help in controlling cholesterol levels and improving blood flow. These foods lower plasma viscosity and hematocrit levels, which enhances blood cell deformability. These rheological benefits may contribute to a better oxygen supply to working muscle tissues.[6,7] Research suggests that garlic may help protect against heart disease and lower cholesterol levels.[8,9]

Ginger stimulates heart muscles and enhances blood circulation throughout the body. The increased circulation is thought to boost cellular metabolic activity, which helps relieve cramps and tension. It also aids in lowering blood pressure and reducing cardiac workload.[10] Herbal preparations serve as the foundation for finished herbal products. These preparations may include whole or powdered herbal materials, as well as extracts, tinctures, and fatty oils derived from herbs. They are produced through processes such as extraction, fractionation, purification, and concentration, among other physical or biological methods. Additionally, herbal preparations can involve steeping or heating herbal materials in alcoholic beverages, honey, or other substances. The herbal syrup is created by combining a concentrated herbal extract with sugar, and alcohol can also be incorporated. This syrup is often made using a decoction of herbs. Mixing a herbal decoction with sugar not only helps thicken the mixture but also preserves it, extending the shelf life of the syrup. The addition of sweeteners can enhance the flavor of certain herbs, resulting in a delicious product. Herbal syrup is defined as a thick, sticky liquid that consists of a concentrated solution of sugar and water, with or without added flavoring or medicinal ingredients..[11-14]

### II. MATERIAL AND METHODS

#### A. Selected ingredients formulation of herbal syrup :

##### 1. Honey :

Synonym:

Madhu, Madh, Mel, Purified honey.

Biological source:

Honey is a viscid and sweet secretion stored in the honey comb by various species of bees, such as *Apis mellifera*, *Apis dorsata*, *Apis florea*, *Apis indica* and other species of *Apis*,

belonging to the family Apidae (Order: Hymenoptera).



Fig 1 : Honey Chemical constituents:

The average composition of honey is as follows: Moisture 14–24%, Dextrose 23–36%, Levulose (Fructose) 30–47%, Sucrose 0.4–6%, Dextrin and Gums 0–7% and Ash 0.1–0.8%. Besides, it is found to contain small amounts of essential oil, beeswax, pollen grains, formic acid, acetic acid, succinic acid, maltose, dextrin, colouring pigments, vitamins and an admixture of enzymes, for example, diastase, invertase and inulase.

Use :

Honey shows mild laxative, bactericidal, sedative, antiseptic and alkaline characters. It is used for cold, cough, fever, sore eye and throat, tongue and duodenal ulcers, liver disorders, constipation, diarrhoea, kidney and other urinary disorders, pulmonary tuberculosis, marasmus, rickets, scurvy and insomnia.

## 2. Ginger :

Synonym :

Rhizomazingiberis, Zingibere

Biological source :

Ginger consists of the dried rhizomes of the *Zingiberofficinale* Roscoe, belonging to family Zingiberaceae.

Chemical constituents :



Fig 2 : Ginger

Ginger contains 1 to 2% volatile oil, 5 to 8% pungent resinous mass and starch. The volatile oil is responsible for the aromatic odour and the pungency of the drug is due to the yellowish oily body called gingerol which is odourless. Volatile oil is composed of sesquiterpene hydrocarbon like  $\alpha$ -zingiberol;  $\alpha$ -sesquiterpene alcohol  $\alpha$ -bisabolene,  $\alpha$ -farnesene,  $\alpha$ -sesquiphellandrene.

Uses :

Ginger is used as an antiemetic, positive inotropic, spasmolytic, aromatic stimulant, carminative, condiment, and flavouring agent. It is prescribed in dyspepsia, flatulent colic, vomiting spasms, as an adjunct to many tonic and stimulating remedies, for painful affections of the stomach, cold, cough, and asthma.

## 3. Garlic :

Synonym :

Allium; Lasan (Hindi)

Biological source :

Garlic is the ripe bulb of *Allium sativum* Linn., belonging to family Liliaceae.

Chemical constituents :



Fig 3 : Garlic

Allicin, a yellow liquid responsible for the odour of garlic, is the active principle of the drug. It is miscible with alcohol, ether, and benzene and decomposes on distilling. The other constituents reported in Garlic are alliin, volatile and fatty oils, mucilage and albumin. Alliin, another active principle, is odourless, crystallized from water acetone and practically insoluble in absolute alcohol, chloroform, acetone, ether, and benzene. The amino acids present in the bulb are leucine, methionine, S-propyl-L- cysteine, S-propenyl-L- cysteine, S-methyl cysteine, S-allyl cysteine sulphoxide (alliin), S-ethyl cysteine sulphoxide, and S-butyl-cysteine sulphoxide.

Uses :

Garlic is carminative, aphrodisiac, expectorant, stimulant, and used in fevers, coughs, febrifuge in intermittent fevers, respiratory diseases such as chronic bronchitis, bronchial asthma, whooping cough, and tuberculosis. It is also used in atherosclerosis and hypertension.

#### 4. Lemon :

Synonym :  
Citrus limon

Biological source :

Lemon is the fruits obtained from citrus limon.



Fig 4 : Lemon

Family :  
Rutaceae

Chemical constituents :

It includes flavonoids and also other compounds such as phenolic acids , carboxylic acid , aminoacids , and vitamins.

Uses :

Lemon is primarily used for its vitamin C nutritional value and potassium content. Intake of citrus fruit reduces the risk of various diseases. They have antioxidant, antimicrobial, antibacterial, antifungal, anti-inflammatory, anticancer, hepatoregenerating and cardioprotective activities.

#### 5. Apple cider vinegar :

What is apple cider vinegar ?

Apple cider vinegar (ACV) is a type of vinegar made with crushed fermented apples, yeast, and sugar. It's used as an ingredient in foods such as salad dressings, pickles, and marinades.

For many years, people have also used it as a home remedy for everything from fighting germs to preventing heartburn. More recently, research has shown that it might have some real health benefits, such as helping reduce blood sugar levels and aiding weight loss.

While there's not a lot of evidence of these benefits, ACV is generally harmless – as long as you use it correctly. And it contains some of the same nutrients as apple juice, including B vitamins as well as antioxidants called polyphenols.



Fig 5 : Apple cider vinegar

Apple cider vinegar benefits :

- It may help with weight loss.
- It may lower cholesterol.
- It may lower blood sugar.
- Lower blood pressure.
- Ease acid reflux.
- Kill germs.

**B. Formula table :**

Sr no.	Ingredients	Batch A	Batch B	Batch C	Batch D	Batch F
1.	Ginger	9ml	8ml	9ml	7ml	8ml
2.	Garlic	8ml	8ml	7ml	9ml	7ml
3.	Lemon	5ml	5ml	5ml	5ml	5ml
4.	Honey	25ml	25ml	25ml	25ml	25ml
5.	Apple cider vinegar	3ml	4ml	4ml	4ml	5ml

**C. Method of preparation for herbal syrup :  
Herbal syrup is prepared by using the following steps**

**Step 1: Method of preparation of decoction**

The initial stage in studying medicinal plant is the preparation of plant samples to preserve the biomolecules in the plants prior to extraction. Plants samples such as leaves, barks, roots, fruits and flowers can be extracted from fresh or dried plant materials such as grinding and drying also influences the preservation of phytochemicals in the final extracts.

**A. Extraction of Garlic :**

- A mixture of garlic and ethanol in the ratio of 1:10, 1:15 and 1:20 (w/v) were carried out using 95% ethanol. 1 g of the sample was soaked in 200 ml of 95% ethanol for 48 hrs at room temperature.
- For soxhlet extraction, 1 g of fresh garlic was performed using a mixture of garlic and 95% ethanol in the same ratio of solvent to solid as the maceration technique.
- The soxhlet condition was done for 1.5 hours at 70°C using soxhlet apparatus.

**B. Extraction of Ginger :**

- First, obtain fresh ginger and wash it thoroughly in water.
- Next, chop the ginger to produce slices.
- Then, set up a Soxhlet apparatus and heat it to a temperature of 80°C.
- The heating time should be observed for 2 hours.

- The extraction process will use a ratio of 50 grams of ginger to 200 milliliters of ethanol solvent.
- Finally, collect the observed ginger oil.

**Step 2: Method of preparation of herbal syrup :**

- To prepare the final herbal syrup 9ml of ginger decoction and 8ml of garlic or 5ml of lemon or 3ml of apple cider vinegar was added ad 50% of honey preservative was mixed slowly by side by side continually stirring.
- The final herbal syrup was prepared and then subjected to evaluation. Herbal syrup was prepared and solubility was checked by observing the clarity of the Solution visually.

**III. EVALUATION**

**3.1 PHYSICAL EVALUATION :**

**1. Colour examination :**

Five ml final syrup was taken into watch Glass and placed against white back ground in white tube light. It was observed for its colour by naked eye.

**2. Odour examination :**

Two ml of final syrup was smelled individually. The time interval among two smelling was kept 2 minutes to nullify the effect of previous smelling.

**3. Test examination :**

A pinch of final syrup was taken and examined for its taste on taste buds of the tongue. Or simply a pinch of syrup was put on tip off tongue for determining test.

Sr no.	Physical parameter	Result
1.	Colour	Brownish-Yellow
2.	Odour	Aromatic
3.	Taste	Sweet, Slightly pungent

### 3.2 PHYSICOCHEMICAL PARAMETER :

1. Determination of pH :
  - Placed an accurately measured amount 10 ml of the final syrup in a 100 ml volumetric flask and made up the volume up to 100 ml with distilled water. The solution was sonicated for about 10 minutes. pH was measured with the help of digital pH meter.
2. Determining of viscosity of syrup :
  - The viscosity of the syrup was determined by using viscometer mainly capillary viscometer, the average viscosity of any syrup at 21-30°C temperature is 700-1300 centipoise or cp, the determined viscosity of syrup was 880cp.
3. Determination of density :
  - The density of syrup can be determined by using the specific gravity of bottle. Clean the specific gravity bottle thoroughly with chromic acid or nitric acid. With the distilled water rinse the bottle for two to three times. Note the weight of the empty dry bottle with the capillary tube stopper (w1). Now fill the bottle with an unknown liquid and place the stopper and wipe of the excess liquid outside the bottle with the unknown liquid in analytical balance (w2). Finally, calculate the weight in grams of unknown liquid.
4. Visual inspection :
  - With the visual inspection, the ingredient & the final product are carefully examined for purity & for appearance Physical appearance of the product for patient adherence compliance is critical so that it should be good looking & elegance in appearance.

### IV. RESULT :

Sr no.	Parameter	Result
1.	Colour	Brownish-Yellow
2.	Odour	Aromatic
3.	Taste	Sweet, Slightly pungent
4.	pH	6.46
5.	Viscosity	0.27 poise
6.	Density	14.2gm
7.	Visual inspection	Good looking

### CONCLUSION :

The present study concluded that by giving a comprehensive view of herbal drugs for the treatment of cough as crude drug as well as poly herbal formulations is good alternatives of modern cough drugs which have a lot of side effects. In the present research polyherbal antitussive syrup containing medicinal plants like garlic, ginger, lemon, apple cider vinegar and honey were formulated & prepared evaluated successfully.

According to present study it was concluded that the prepared polyherbal anti-tussive syrup shows good physical characteristics, exhibit antimicrobial activity & good accelerated stability study. This research successfully concluded that the formulated poly herbal anti-tussive syrup shows its maximum effect and also decrease in the severity of cough, the good tolerability profile of the syrup makes it particularly useful in patients with cough.

Herbal medicines are still widely using for primary health care in so many countries because of cultural acceptability, compatibility with human beings and with lesser side effects. In this study we prepare cholesterol control herbal syrup by using decoction process of ginger and garlic. Ginger and garlic both lower cholesterol levels by increasing good cholesterol in the body. As above mentioned both herbs are used in the treatment of many disorder. Honey is also used to lower cholesterol level in body.

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