

**FORMULATION AND DEVELOPMENT OF ZINGER AND GARLIC SYRUP FOR
CONTROL CHOLESTEROL AND BETTER BLOOD FLOW**Arti Bhagat¹ and Satyam Shrivastava^{2*}¹Sant Gahira Guru Vishwavidyalay Sarguja Ambikapur Chhattisgarh.^{2*}Swami Vivekanand College of Pharmacy, Ratibad Rd, Kopal, Bhopal.

Article Received on: 24/04/2024

Article Revised on: 14/05/2024

Article Accepted on: 04/06/2024



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Bhopal.satyamshrivastava431@gmail.com**ABSTRACT**

High cholesterol level in the body is most common problem in world wide .it is gradually increased and cause many more cardiovascular disorder. Ginger and garlic both are most widely used spices in the Indian kitchen. Both work as 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. Syrup is for making them easily consumables. It contains ginger, garlic, honey base and alcohol. Quality of final herbal syrup was evaluated by post formulation parameter.

KEYWORDS: Syrup, Herbal syrup, Ginger, Garlic, Herbal medicine.**INTRODUCTION**

Plants are used as healing agents since time immemorial in both organized (Ayurveda, Yunani) and unorganized (folk, tribal, native) form.^[1] The use of conventional medicine and medicinal plants in most developing countries, as a normative basis for the maintenance of good health, has been widely observed.^[2] There is a need for the development of reliable standardization tools for effective utility of these traditional medicines.^[3] Blood lipids are related to several factors such as lifestyle, diet, and smoking, body mass index (BMI), waist circumference, physical activity, sex and age.^[4-6] Dyslipidemia consists of different abnormalities in lipid profile and is one of the main risk factors of several diseases such as cardiovascular disease (CVD), diabetes mellitus, hypertension, stroke, or acute pancreatitis.^[7] Increasing its prevalence is related to unhealthy diet and lifestyle changes in the most developed and developing countries.^[8-10] To prevent coronary artery disease (CA), hypolipidemic medicines play major role. Many hypolipidemic drugs have already been proved to be useful in lowering serum lipid levels in patients.^[11] However, its side effects in long term treatment were more reported and its prices were still expensive. Us, efforts to develop effective and better hypolipidemic drugs had led to the discovery of natural medicinal herbs.^[12] Cardiovascular disease remains the major cause of death in both developed and developing countries, accounting for roughly 20% of all worldwide deaths per year.^[13] Healthy diet and natural food are so important to prevention and sometime treatment of diseases. Cholesterol control and better blood flow consequences

of ginger and garlic lowered plasma viscosity and haematocrit and a higher blood cell deformability are rheological advantages which might contribute to a better oxygen supply to the working muscle tissues.^[14-15] Garlic may protect against heart disease and high cholesterol.^[16-17]

Ginger stimulates heart muscles, stimulates blood circulation throughout the body. The increased blood circulation is believed to stimulate cellular metabolic activity which helps to relief the cramps and tension. It also helps to reduce blood pressure and cardiac workload.^[18] Herbal preparations are the basis for finished herbal products and may include communicated or powdered herbal materials, or extracts, tinctures and fatty oils of herbal materials. They are produced by extraction, fractionation, purification, concentration or other physical or biological processes. They also include preparations made by steeping or heating herbal materials in alcoholic beverages and honey, or in other materials. Herb syrup is prepared by adding a concentrated herbal extract with sugar, and alcohol was also used. Herbal syrup was made with decoction. Mixing a decoction of herbs with sugar helps to thicken the recipe and preserve it. This increases the shelf life of the formula. Added sweeteners can also help enhance the taste of certain herbs. The resulting syrup is delicious! It is defined as a thick, sticky liquid consisting of a concentrated solution of sugar and water with or without added flavoring or medicinal ingredients.^[19-22]

Following are the ingredients used in herbal syrup formulation

Garlic: The fresh garlic slices were put in a thin layer and dried to a final moisture content of about 5% (wet basis), by microwave vacuum combined with vacuum drying for garlic powder. During MVD, the rotation speed of the turntable was 5 rpm.

Plant profile of herbal syrup.^[23-28]

Ginger: The dried rhizomes were the powdered mechanically, thus made ready for decoction.

Alcohol: It uses in small quantity act as preservative.

Honey: Sweetening Agent, Thickening Agent.

Sr. No	Plant	Biological Name	Family	Chemical constituents	Uses
1.	Ginger	Zingiber officinale	Zingiberaceae	Gingerols, zingiberene, curcumene, farnesene, shogaols, paradols, zingerone	Gastrointestinal relief, Anti-Inflammatory Effects, Effect on cardiovascular system, Hypoglycemic and hyperglycemic activity, Cancer preventive effects, Breast cancer, Larvicidal activity, Antioxidant activity, Antimicrobial activity of ginger, Analgesic effect, Antiviral effect, hypolipidemic, Radioprotective Effect
2.	Garlic	Allium sativum	Liliaceae.		Antihypertensive, Wound Healing, Antidiabetic, Anticancer, Antiatherosclerosis and Hypolipidemic, Antioxidant, anti-inflammatory and anti stress properties, immunity booster, bloodthinning

Honey: Honey is a natural food and a complex mixture of sugars, in which fructose and glucose are the main constituents.^[29] Fructose is a monosaccharide, which is absorbed more slowly from the gastrointestinal tract compared to glucose, so after fructose consumption blood glucose increases slightly.^[30] Natural honey contains various antioxidants and according to previous findings, antioxidant intake was associated with weight loss in obese individuals and beneficial effects on risk factors of CVD.^[31-32] Honey intake considerably decreased postprandial glycemic response or had less adverse effect on plasma glucose than other sugars or sweeteners in diabetic patients.^[33-34]

Alcohol: Ethanol is an extensively used excipient in various pharmaceutical formulations.^[35] It can function as a cosolvent to increase drug solubility, and as a preservative due to its antimicrobial activity.^[35-36] In herbal medicines, ethanol is often used as an extraction solvent to obtain the constituents of the herbs necessary for the product efficacy.^[36-37]

OBJECTIVES

- To reduce symptoms of hyperlipidemia and to reduce the risk of lipid depositions in plasma.
- Co-herbal formulations enhance the therapeutic action and reduce the concentrations of single herbs, thereby reducing adverse events.
- Investigate the Phytochemical anti-hyperlipidemic activity of metabolic extract of ginger and garlic fruits.

MATERIAL AND METHODS

Materials

Ginger, garlic and honey all was purchased from local market from Bhopal. Ethanol was procured from Central Drug House (P) Ltd. New Delhi. All other solvents and chemicals used were of analytical grade.

Formulation of poly-herbal syrup [100 ml]

Sr. No.	Ingredient	Quantity taken
1	Ginger powder	5gm
2	Garlic powder	5gm
3	Honey	66.7gm
4	Purified water	Upto 100 ml
5	alcohol	As preservative

Methods

Herbal syrup is prepared by using the following steps

- Step 1: Method of preparation of decoction
- 5 gm of garlic powder + 5 gm of ginger powder Mixed in 1000 ml of purified water
- Boil until total volume becomes 1/4th of initial volume.
- Then cool the decoction.
- After cooling filter with filter press.

Step 2: Method of preparation of simple syrup

Mix 66.7%w/w of honey in required quantity of distilled water to prepare a concentrated solution of simple syrup.

Step 3: Method of preparation of herbal syrup

Filtrate was taken and added to simple syrup yield final syrup

For the preparation of final herbal syrup, mix one part of

decoction with five parts of simple syrup [1:5]. Then add excipient and finally make up the value to 100 ml with purified water.

Evaluation parameter

Determination of Ph

The pH determination of syrup by using two techniques is

- a) Glass electrode.
- b) pH paper.

Take 10 ml of final syrup in the volumetric flask and make up the volume up to 100 ml with distilled water. The pH was measured by using digital pH meter.

Taste: A pinch of final syrup was taken on taste bud of tongue to detect the taste.

Colour: Colour examination is done by observing the syrup directly with our naked eye.

Odour: 5 ml of final syrup was smelled individually then the odor can be detected.

Determine viscosity

Viscosity of syrup can be determined by using Ostwald viscometer. First clean the Ostwald viscometer thoroughly with warm chromic acid or acetone Place the viscometer in vertical position on a suitable stand now fill the water up to mark —G1 in dry viscometer. Note the time required for water to flow from mark A to mark B. For at least three times, repeat the filling process and note the time to obtain accurate readings. Now rinse the viscometer and fill it with test liquid (syrup) till mark a, find out the time required for liquid to flow to mark B. The density can be determined by using specific gravity bottle.

Formula for viscosity = $\frac{\text{Density of test liquid} \times \text{Time required to flow test liquid}}{\text{Viscosity of water}}$

Determination of density: The density of syrup can be determined by using 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 empty dry bottle with capillary tube stopper (w1). Now fill the bottle with UN know liquid and place the stopper and wipe of the excess liquid outside the bottle with unknown liquid in analytical balance (w2). Finally calculate weight in grams of UN known liquid.

Formula for density: $\text{Density of liquid under test (syrup)} = \frac{\text{weight of liquid under test}}{\text{volume of liquid under test}}$.

Determination of specific gravity

- 1) Clean thoroughly the specific gravity bottle with chromic or nitric acid.
- 2) Rinse the bottle at least two to three times with purified water.
- 3) If required, rinse the bottle with an organic solvent like acetone and dry.
- 4) Take weight of empty dry bottle with capillary tube stopper.
- 5) Fill the bottle with distilled water and place stopper; wipe out excess liquid from side tube using tissue paper (w2).
- 6) Weight bottle with stopper and water on analytical balance (w2).
- 6) Repeat the procedure for liquid under test by replacing the water after emptying and drying as mentioned in step 4 to 6.
- 7) Weight bottle with stopper and liquid under test on analytical balance (w3).

Formula for specific gravity: $\text{Specific gravity of liquid under test (syrup)} = \frac{\text{weight of liquid under test}}{\text{weight of water}}$.

RESULT AND DISCUSSION

The result of post evaluation parameters such as ph determination, taste, color, odor, viscosity, density and specific gravity was analyzed and given in table. The daily consumption of both herbs (ginger and garlic) is reduced the harm of cancer, especially colon cancer as well used as anti diabetic many more disorders. The prepared herbal syrup subjected to various evaluation parameters and compared with standard hypolipidemic syrup.

S. no.	Evaluation parameters	Test
1.	pH Determination	
	pH paper	Neutral
	pH meter	6.46
2.	Taste	Sweet, slightly pungent
3.	Color	Yellowish-brown
4.	Odor	Aromatic
5.	Viscosity	0.27 poise
6.	Density	14.2gm
7.	Specific gravity	0.5035

CONCLUSION

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. The present study helps to develop effective and safe herbal syrup with honey as a base of cough syrup.

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