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Original Research Article

Formulation and evaluation of herbal syrup of ginger extract

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ABSTRACT

Zingiber officinale is a plant found locally in India that is widely used as a flavoring agent in savory dishes such as curries and sweets such as cakes and biscuits, alcoholic beverages as well. like in tea. Ginger is a well-known herb, commonly used in traditional medicine all over the world. Ginger has been used for thousands of years to treat colds, nausea, arthritis, migraines, and high blood pressure. The many pharmacological activities of ginger are antiemetic, antidiabetic, analgesic, anti-arthritis, anticancer, antioxidant, anti-ulcer, antibacterial, anti-inflammatory, estrogenic and cardiovascular. A chemical stimulant and an unsaturated liquid phenolic ketone C17H24O3 are responsible for the pungent taste of ginger. The main components of ginger are aromatic essential oils, antioxidants and pungent oleoresin. These aromatic or spicy compounds have been identified as C6H5C(O)CH3, known as a chemical stimulant, phenolic ketone unsaturated liquid C17H24O3 and Vanillylacetone. Lab-scale formulation is made with herbal syrup and evaluated for several parameters such as pH, viscosity, density, stability testing during formulation evaluation. is a stable and ready-to-know formula. F1, F2, F3 and F4 have been prepared with different amounts of ingredients such as alcohol, sugar and a final amount of syrup. Results show that Herbal Syrup Formula 4 (F4) is more stable than other forms.

1. Introduction

1.1. Ginger

Canton ginger belongs to the family Zingiberaceae.[1] It is a herbaceous perennial plant.[2] It is commonly used as a spice and herbal medicine.[2] The part used of the plant is the rhizome. The plant produces an orchid-like flower with yellow-green petals speckled with purple. Ginger (Zingiber officinale (L.) Roscoe) has been used as a spice for over 2000 years.[3] Ginger contains up to 3% essential oil that gives the aroma of the spice.[4] In India and countries with hot and humid climates, ginger is consumed in large quantities and is good for digestive problems.[5] Ginger belongs to the plant family that includes cardamom and turmeric. Its spicy taste is mainly due to the presence of ketones, especially ginger root, which seems to be the main component of ginger studied in most health-related scientific studies.[6] The rhizome, which is the horizontal stem from which the roots grow, is the main part of the ginger that is eaten. Ginger's current name comes from the Middle English gingivere, but the spice dates back more than 3,000 years to the Sanskrit word srngaveram, meaning "horny root", due to its shape.[7] In Greek it is called ziggiberis, and in Latin zinziberi. Interestingly, ginger does not grow in the wild and its true origin is uncertain. The Indians and Chinese are said to have produced ginger as a root tonic for over 5000 years to cure many ailments, and the herb is now grown in the

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humid tropics. India is the largest ginger producer. Ginger has been used as a salting agent since long before official history was recorded. It was an extremely important trade item and was exported from India to the Roman Empire over 2000 years ago, where it was particularly prized for its healing properties. Ginger continued to be a highly sought after commodity in Europe even after the fall of the Roman Empire, with Arab merchants controlling the trade in ginger and other spices for centuries.[8] In the 13th and 14th centuries, the value of a pound of ginger was equivalent to the price of a sheep. Raw and preserved ginger was introduced to Europe in the Middle Ages, where it was included in the official pantry of various countries. In the Middle Ages, it was imported in canned form for use as sweets. Queen Elizabeth I of England is credited with inventing the anthropomorphic gingerbread, which has become a popular Christmas treat.[9]

1.2. Classification

Taxonomic	Dry ginger plant
Domain	Eukaryota
Kingdom	Plantae
Phylum	Spermatophyta
Subphylum	Angiosperms
Class	Monocotyledon
Order	Zingiberales
Family	Zingiberacea
Genus	Ginger
Species	Zingiber officinale

1.3. Active ingredients

At least 115 components of fresh and dried ginger varieties have been identified through multiple analytical procedures. Ginger contains many active components, such as phenolic compounds and terpenoids.[10] The phenolic compounds in ginger are mainly ginger root,[6] -shogaol and paradols. In fresh ginger, ginger root contains the main polyphenols such as 6-gingerol, 8-gingerol and 10-gingerol. Ginger root is the main component of fresh ginger and was found to be slightly reduced in dried ginger, while the concentration of[6] -shogaol, which is the main dehydration product of gingerol, was higher.[11] ginger. At least 31 compounds related to gingerol have been identified from crude methanol extracts of fresh ginger rhizomes. Ginger is rich in active ingredients, such as phenolics and saponins. Ginger has been subdivided into at least 14 bioactive compounds, including[4] -gingerol,[6] -gingerol,[8] -gingerol,[10] -gingerol,[6] -paradol,[12] -shogaol,[6] -shogaol, 1-dehydro-[10] -gingerdione,[10] -gingerdione, 3-heptanone, 5-hydroxy-1,7-bis(4-hydroxy-3-methoxyphenyl), C21H24O6, log linear heptanoid, 1,7-bis-(4′ hydroxyl-3′ metoxyphenyl)-5-methoxyhepthan-3-one and metoxy-[10] –gingerol.[13] The proportions of each individual ingredient in a sample of ginger depend on the country of origin, commercial processor and fresh, dried or processed ginger.[12,14]

1.4. Herbal syrup

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.[15–17]

1.5. Following are the ingredients used in formulation

1. Ginger: It is used in various herbal and ayurvedic treatment of cancer. The Soxhlet extracted alcoholic extract was obtained which was further filtered and used.
2. Orange oil: It consist fruit of plant citrus aurantium belonging to family: Rutaceae. It contain not less than 2.5% of volatile oil. It uses as antioxidant, anti-cancer and neurodegenerative disorder.[18]
3. Alcohol: It uses in small quantity act as preservative.
4. Invert sugar base: It was prepared by mixing 2 cups (480 mL) of water with 4.4 cups (1 kg) of granulated sugar and 1/4 teaspoon of cream of tartar in a pot. The mixture was boiled over medium heat until it reaches 236°F (114°C), stirring occasionally. Next, remove the mixture from the heat, cover, and let cool.[19]

Table 1: Role of ingredients in herbal syrup

Sr. No.	Ingredient	Role
1.	Ginger	Antioxidant, Free Radical Scavenging
2.	Orange oil	Flavoring agent
3.	Sugar Base Invert	Preservative
4.	Alcohol	Preservative
5.	Amaranth red	Coloring agent

2. Materials and Methods

Herbal syrup was prepared by decoction method. Ginger Extract was obtained as fine extract from Herbal Creations Pvt Ltd. The extract subjected to prepare an ethanolic extract to obtain the ethanol specific active constituents by Soxhlet extraction method. Further the extract was filtered, and the aliquots of the quantities were used as given in the table to prepared formulations F1 to F4. All extract are mixed with

each other and 50ml of syrup was obtained. The coloring agent, flavoring agent are added to it. This obtained syrup was transferred to amber color bottle, closed it tightly and placed it into cool dry place.Preparation of herbal syrup: The preparation of herbal syrup was performed as per quantities given in Tables 2, 3, 4 and 5 and evaluation parameters are shown in Table 6.

Table 2: Formulation No.1 (F1) - For 50ml.

Sr. No	Ingredient	Quantity
1.	Ginger extract	7ml
2.	Orange oil	5ml
4.	Invert Sugar Base	38ml

Table 3: Formulation 2 (F2) - for 50ml.

Sr. No.	Ingredient	Quantity
1.	Ginger extract	5ml
2.	orange oil	2ml
3.	Invert Sugar Base	33ml
4.	Alcohol	10ml

In above formula (F2), we used alcohol because in the formulation number 1 (F1), sugar was not able to inhibit the growth of fungi, so we use alcohol.

Table 4: Formulation 3 (F3) - For 50ml.

Sr. No.	Ingredient	Quantity
1.	Ginger extract	8ml
2.	Orange oil	2ml
3.	Invert Sugar Base	33ml
4.	Alcohol	7ml

The formulation number 2 was rejected because of more quantity of alcohol is use. In this formula we use alcohol as minimum quantity.

Table 5: Formulation 4 (F4) – for 50ml.

Sr. No.	Ingredient	Quantity
1.	Ginger extract	15 ml
2.	Orange oil	4ml
4.	Invert Sugar base	20ml
5.	Alcohol	11 ml

Following evaluation parameters were performed on formulation 4 (F4).

2.1. Evaluation parameter

2.1.1. Density

It was evaluated by Formula as given below, Formula for density: Density of liquid under test (syrup) = weight of liquid under test

/volume of liquid under test = w_3/v

2.1.2. Specific gravity

Specific Gravity was evaluated by the formula as given below

Specific gravity of liquid under test (syrup) = weight of liquid under test /weight of water = w_5/w_4.

2.2. Viscosity

2.2.1. Viscosity was determined using the following formula

Density of test liquid × Time required to flow test liquid

Density of water × Time required to flow water

2.3. pH

pH was determined on pH meter

3. Result and Discussion

The final formulation (F4) was obtained is stable than formulations F1, F2, F3. The formulation (F4) was obtained by minimizing the error in formulation F1, F2, F3. The formulation (F4) having antioxidant property hence it will be very helpful for researchers as well as industries to make the similar formulations on large scale.

Table 6: Evaluation of herbal syrup

Sr. No.	Parameter	F1	F2	F3	F4
1.	Density	1.50gm.	1.43 gm.	1.29gm.	1.50gm.
2.	Specific gravity	0.6479	0.6576	0.6593	0.6593
3.	Viscosity	3.85cp.	3.89cp.	3.66cp.	3.66cp.
	pH Determination				
4.	a) pH paper	Neutral	Neutral	Neutral	Neutral
	b) pH meter	7.55	7.65	7.44	7.44
	Organoleptic Characters				
5.	1) Color	Reddish	Reddish	Reddish	Reddish
	2) Odor	Aromatic	Alcoholic	Aromatic	Aromatic
	3) Taste	Sweet	Sweet	Sweet	Sweet
	4) Appearance	Turbid	Turbid	Clear	Clear

4. Conclusion

The Herbal formulation was prepared and F4 can be formulated and prepared on large scale.

5. Source of Funding

None.

6. Conflict of Interest

None.

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