JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

Formulation Development And Evaluation Of Herbal Cough Syrup

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Abstract: The cough it is a most common problem are face by the all people. There are two types of cough one is the Dry cough and second is wet cough. The dry cough is a no mucous and secretion while in wet cough there is cough mucous or secretion. The syrup is most commonly used and popular dosage form there is used in cure the cough and cold because it having ease of patients compliance. The herbal cough syrup was formulated using Kiwi fruit extract, liquorice extract, Cinnamon extract, tulsi extract, ginger extract, lemon oil, honey as a main ingredient along with Honey. Today syrup is used for treatment of May ailments and to overcome symptoms of disease. Formulation at laboratory scale was done and evaluate for number of parameters such as PH, viscosity, Density, stability testing during evaluation formulation found to be stable and ready to use in a cough treatment.It is found that Antitussive activity produced by the Herbal formulation in the minimum dose was much better than the standard drug.

Keywords: Cinnamon extract, ginger extract, kiwi fruit extract, liquorice extract, lemon oil, honey Cough syrup

Introduction

Cough :-

Coughing is a quick, repeating activity that helps to cleanse the airways of various fluids, irritants, microorganisms, and foreign objects. The brain detects any obstruction or discomfort in the upper airway or throat and signals the body to cough to expel the particles. Cough is one of the most prevalent health issues. An infection of the respiratory system can also cause coughing.[1] Keep your throat free of phlegm and other irritants with the aid of a good cough. But persistent coughing can also be a sign of a number of diseases. The cough response consists of three phases: intake, forced exhalation against a closed glottis, and a sudden expulsion of air from the lungs after opening of the glottis. There are two types of coughing: forced and voluntary.[2] Coughing is a common symptom of many microorganisms, including bacteria and viruses, which aid in the transfer of the illness to new hosts.The majority of the time, a respiratory tract infection is the culprit behind irregular coughing, but it can also be brought on by choking, smoking, air pollution, asthma, gastroesophageal reflux disease (GERD), post-nasal drip, chronic bronchitis, lung tumours, heart failure, and drugs like ACE inhibitors.[3]

Types of cough:-

The cough is mainly classify in two types-

- **Dry cough:-** It is an efficient and productive cough. These dry coughs are brought on by dust, smoke, or dry irritation.
- **Wet cough:-** These types of coughs are contagious and ineffective. It is most helpful for clearing mucus and other objects out of the respiratory tract, which is where the infection originates.[4]

Classification of cough:□

- Acute cough- Not more than 3 weeks duration.
- Chronic cough- More than 3 weeks.
- Dry cough- No mucous or secretion.
- Wet cough- with mucous or secretion.
- Cough from chest and throat- productive and non-productive.
- Paroxysmal cough- spasmodic and recurrent.
- Bovine cough- soundless cough due to paralysis or larynx.
- Psychogenic cough- self conscious activity of the patient to draw attention.[5]

On the basis of duration of action of cough is classified as:-

1. Acute cough
2. Subacute cough
3. Chronic cough [6]

Acute cough:-

Coughs that last three weeks or less are referred to as acute coughs.The most frequent causes of acute cough are acute bronchitis and upper respiratory tract infections.[7,8]

Subacute cough:-

The cough is lasts for three to eight weeks. It is the cough began with an upper respiratory tract infection. The most common conditions to take into consideration are asthma, bacterial sinusitis, and post infectious cough.[9]

Chronic cough:-

The cough lasts for more than eight weeks is known as chronic cough.[10]

Needs of plants:-

Man has employed plants and herbs to treat sickness since the dawn of time. For a range of purposes, including the treatment of several diseases, shelter, food, clothing, writing, weapons, and cosmetics, plants have offered and continue to offer essential materials. There is no question that the great civilizations of prehistoric China, India, and North Africa left written records of chronic coughing. The resourcefulness of man in employing plants to treat a variety of diseases. Most commonly prescribed cough medicines are made from botanical extracts. Numerous compounds, including those derived from diverse plant species and their derivatives, are well-known western medications for treating cough or underlying disorders, including codeine, morphine, noscapine, bromhexine, guaifenesin, ephedrine, and cromolyn. [11]

Herbal cough syrup:-

Herbal cough syrups made from concentrated herbal teas are kept in sugar or honey. Herbal syrups have long been used to enhance the flavour and shelf life of bitter medicinal plants.[12]

Advantages of herbal cough syrup:-

- No adverse effects.
- Readily available.
- Simple to modify the dosage for the child's weight.
- There is no need for nursing care, therefore the patient can take it without help.
- The liquid dosage form is executed for products like cough medicines.
- Herbs Grow in everyday life.
- By delaying oxidation while sugar is hydrolyzed into cellulose and dextrose, antioxidant.
- Good patient compliance, especially for young patients for whom the test syrup is sweet.
- It serves as a preservative by osmotically preventing the growth of bacteria, fungi, and mold.[13]
- Low cost.
- Not required prescription.
- Harmless.[4]

Disadvantages of herbal cough syrup:-

- Solid sedimentation can occasionally give a product a foot.
- Suspension suspensions must be packaged in unit dosage forms in order to achieve dose precision.
- When preservation is not added in the proper proportion, the same microbiological contamination occurs.
- Another drawback of herbal therapy is the risk of self-dosing, which is quite uncommon.
- Sucrose from saturated syrup may crystallize as a result of changes in storage temperature.[13]

Ideal properties:-

- It can relieve symptoms of cold and cough, such as congestion , coughing, and sore throat.
- It can help soothe and improve the respiratory system.
- It can boost the immune system and help the body fight infection.
- It can reduce inflammation in the respiratory system.
- It can help to loosen and expel mucus from the lungs, thus providing relief from congestion.
- It can reduce coughing and help to better sleep.
- It is natural and safe.[1]

Aim:

To formulate develop and evaluate herbal cough syrup.

Objective:

- For treatments of many ailments and to overcome symptoms of disease the herbal cough syrup is used.
- To defense and protect against, infection and disease.
- To give complete relief from cough.
- To reduce cough in the respiratory tract infection.

Formulation Table:

Sr. No.	Ingredients	F1	F2	F3
1	Kiwi fruit	5ml	5ml	5ml
2	Tulsi	6ml	5ml	4ml
3	Ginger	4ml	4ml	4ml
4	Cinnamon	4ml	5ml	6ml
5	Honey	15ml	15ml	15ml
6	Licorice	5ml	5ml	5ml
7	Lemon oil	1ml	1ml	1ml

Materials and Methods

Sr. no.	Ingredients	Role
1	Kiwi Fruit	Antioxidant
2	Tulsi	Antitussive, Antibacterial
3	Ginger	Antitussive
4	Cinnamon	Anti-inflammatory, Antitussive
5	Honey	Base viscosity modifier, expectorant
6	Licorice	Expectorant
7	Lemon oil	Preservatives

Extraction process:-

Kiwi Fruit:-

Four kiwi fruits, weighing an average of 35 g each, had their outer covering removed before being cut into small pieces and added to 100 ml of water, which was then slowly heated to create the extract. The extract was filtered and then allowed to cool. From the total extract, 7 ml of the solution are measured.[14]

Tulsi:-

To make the extract, combine around 20 g of basil leaves with 100 ml of water. The extract was filtered and then allowed to cool. From the total extract, 5 ml of the solution are measured. [14]

Ginger:-

In a beaker for 72 hours, 20g of fresh ginger root was soaked in 200 ml of 100% ethanol. The entire mixture was filtered to remove residue after 72 hours.[15]

Cinnamon:-

Utilising the Soxhlet extraction process, cinnamon essential oil was extracted. To keep the cinnamon powder from floating, 30 g of it was added to the extraction thimble and coated with glass wool. Chips in a circular bottom flask that was boiling were weighed. The flask with the spherical bottom was then filled with 250 ml of alcohol. The soxhlet was heated for 6 hours at 65 oC at 1 atm.[16]

Licorice:-

200 cc of 100% ethanol and 20 g of licorice powder in a beaker for 72 hours. The entire combination was filtered to get rid of any leftovers after 72 hours.[17]

Procedure:-

15 ml of honey should be placed in a beaker. Kiwi fruit extract should be added, and the mixture should be stirred carefully before tulsi and cinnamon extract are added. After thoroughly combining, add the licorice essence and stir well. After adding lemon oil as a preservative, thoroughly whisk this concoction.

Fig:Formulation 1

Fig:Formulation 2

Fig:Formulation 3

Evaluation parameter:-

pH value :

10 ml of the resulting syrup, precisely measured, was added to a 100 ml volumetric flask, and the remaining 100 ml was filled with pure water. For roughly 10 minutes, the solution was sonicated. Using a digital pH metre, pH was measured.

Viscosity:-

Thoroughly clean the Ostwald viscometer with warm chromic acid and if necessary used

1. An organic solvent such as acetone.
2. Mount viscometer in vertical position on a suitable stand.3
3. Fill water in dry viscometer up to mark G.
4. Count time required, in second for water to flow from mark A to mark B.
5. Repeat step 3 at least 3 times to obtained accurate reading.
6. Rinse viscometer with test liquid and then fill it up to mark A, find out the time required for liquid to flow to mark B.
7. Determination of densities of liquid as mentioned in density determination experiment.

Density of test liquid × Time required to flow test liquid

Viscosity = × Viscosity of water

Density of water × Time required to flow water

show the results obtained for viscosity of formulated batches of syrup. The viscosity of formulation was found to be 0.0492 poise for the range of 0.0492-0.03989 poise for all these formulation.

Density:

1. Cleaned the specific gravity bottle.

2. The bottle was cleaned at least two times with distilled water.

3.Measured the weight of empty dry bottle syrup with stopper(w1)

4. The bottle was filled with final syrup and placed the stopper,wipe out excess syrup from outside the tube.

5. Measure the weight in grams of syrup(w2).

6.Calculate weight in grams of syrup(w3).

7. Formula of density: Density of liquid under test (syrup)=weight of syrup under test/volume of final syrup under test =W3/V.

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).

7) Repeat the procedure for liquid under test by replacing the water after emptying and drying as mentioned in step 4 to 6.

8) Weight bottle with stopper and liquid under test on analytical balance (w3).

Formula for specific gravity: Specific gravity of liquid under test (syrup) = weight of liquid under test /weight of water = w5/w4.

Organoleptic Properties:-

Colour:

The findings for the hue of syrup batches that were created. The optimised batch's formulation was discovered to be a yellowish-brown tint. For batches F1, F2, and F3, the formulation's hue ranges from yellowish brown to dark brown.

Odour:

The results of smelling batches of syrup that had been made. For the F1, F2, and F3 batches, the formulation scent was aromatic.

Taste:

The outcomes of tests conducted on batches of syrup that had been developed. The formulation test for batches F1, F2, and F3 was intensely pungent.

Result:

Sr. No	Parameters	F1	F2	F3	Marketed Preperation
1	Density	1.12661kg\m^3	1.11664kg\m^3	1.07676kg\m^3	1.05682kg\m^3
2	Specific gravity	1.131kg\m^3	1.121kg\m^3	1.081kg\m^3	1.061kg\m^3
3	Viscosity	3.59cp	2.98cp	2.39cp	3.50cp
4	pH value	4.49	4.38	4.83	5.12
5	Organoleptic characters				
	a)colour	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown
	b)odour	Aromatic	Aromatic	Aromatic	Aromatic
	c)Taste	Slightly pungent	Slightly pungent	Slightly pungent	Slighty pungent
	d)Appearance	Turbid	Turbid	Turbid	Turbid

Discussion

In contrast to synthetic pharmaceuticals, which are seen as being dangerous to both humans and the environment, herbal products are now seen as the embodiment of safety. However, herbs have long been valued for their therapeutic, flavour, and fragrant properties. It's time to advertise them worldwide. The herbal syrup that has been made has antioxidant properties. About 100 mg of vitamin C are found in one kiwi fruit. Additionally, it is used to treat sleep disorders and insomnia. It encourages restful sleep naturally.The findings of this investigation indicate that the herbal preparations have antitussive action. Because of its purported ability to both prevent and treat cough, the component of the herbal cough mixture was chosen. Phamacognostical research, which include macroscopical examination and proximal analysis, were used to identify the crude medicines. We were able to determine the purity of the drug using macroscopic criteria like colour, aroma, taste, size, and shape as well as proximate analysis parameters like viscosity, density, specific gravity, and ph value determination. Following formulation completion, many physical parameters were examined. We were able to standardise the formulation and its specificity to the users with the use of many factors including colour, aroma, taste, pH, specific gravity, viscosity, and density. All of the parameters were discovered to be within the limit.

Conclusion:-

Using herbal elements such kiwi fruit, tulsi, ginger, cinnamon, licorice, honey, and lemon oil, the first, second, and third formulations were made. And formulation number three is more efficient than formulations first and second. The value of F3 has greater similarities to the marketed preparation when we compare the densities of F1, F2, and F3 with those products. Marketed preparation has a density of 1.056821 kg/m3, while F3 has a density of 1.07676. Marketed preparation and F3 have specific gravities of 1.06 and 1.08, respectively. Marketed preparation has a pH value of 5.12, while F3 has a pH value of 4.83. F3's organoleptic properties are comparable to those of the commercial product. The current study has offered experimental support for the formulation of poly-herbal cough syrup's ability to prevent coughing.

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