

FORMULATION AND EVALUATION OF HERBAL COUGH SYRUP

Ms. Harshali . N. Patil*, Ms. Sakshi T. Thakare²,

Mr. J. M. Abbas³.

Aditya Institute of Pharmacy, Derabardi , Industrial area, Chalisgaon, Dist- Jalgaon, Maharashtra, India,424101

Abstract

Colds and flu, along with associated symptoms including coughing and sore throats, are among the most common issues affecting both adults and children. One common respiratory ailment that can have a major impact on one's quality of life is coughing. Using Sucrose as a base, syrup is a popular and usually beneficial dosage form for treating colds and coughs. To make the herbal cough syrup, we used medicinal plants that function as natural ingredients, like Adhatoda Vasica, tulsi, clove, fennel, turmeric, honey, etc. Two herbal cough syrups are the subject of the study, which also aims to assess parameters like turbidity, colour, odour, taste, pH, density, and specific gravity. Where accelerated stability testing changes are compared. Thus, two formulae (F1 and F2) of herbal cough syrup made from Adulsa were produced and evaluated utilizing evaluation criteria.

Keywords :- Cough, Cough Syrup, Antitussive, Extraction, Evaluation.

Introduction

Herbal formulation :-

Herbal remedies are used to treat a variety of illnesses. Herbal formulations are dosage forms that contain one or more herbs or processed herbs in predetermined amounts to offer particular nutritional and aesthetic advantages. Intended for use in the diagnosis, treatment, and prevention of human illnesses (1).

Herbal Medicine

Phytomedicine and herbalism are other names for herbal medicine. This type of medicine treats illnesses by using plants or their unprocessed by-products. It might also contain bacterial or fungal products from animals. Herbal or plant-based remedies have been utilized to prevent, treat, and mitigate ailments since ancient times and as time goes on the herbal components of these natural sources are improved. Ancient societies are where herbal medicine first appeared. It involves using plants medicinally to treat illnesses and improve overall health and well-being. Certain herbs contain strong (potent) components and should be used with the same caution as prescription drugs (2).

Cough:-

Coughing is a sudden, frequently recurring activity that helps remove fluids, irritants, foreign objects, and bacteria from the major breathing passages (3). The brain believes a foreign element is present when there is an obstruction or irritation in the throat or upper airway, and it instructs the body to cough in order to get rid of it. Coughing is usually completely natural. Coughing can help keep phlegm and other irritants out of your throat. On the other hand, persistent coughing may also indicate a variety of illnesses (3).

Types of cough

- 1) Acute cough- less than 3 weeks duration
- 2) Chronic cough- More than 3 weeks.

- 3) Dry cough- No mucous or secretion.
- 4)Wet cough- with mucous or secretion
- 5)Both protective and non protective coughing – in the chest and throat.
- 6)Paroxysmal cough- spasmodic and recurrent (4).

Herbal cough Syrup :-

A prepared combination and concentrated decoction is known as herbal syrup. Use honey, sugar, or alcohol occasionally. The foundation of this type of syrup is a potent herbal infusion, which is thickened and preserved by combining it with sugar honey (5). The majority of consumers think herbal cough syrup is safe and effective because they are easier to swallow and absorb more quickly than tablets or capsules, syrups are a common way to administer anti-tussive medications (6) (7). There are identical to be had artificial cough arrangements they purpose numerous destructive impact however natural cough syrup bring herbal detail having no any aspect impact in standard fitness experts having problems of gaining access to effectiveness and protection herbal treatment (5). Usually, herbal cough syrup is used instead of traditional cough syrup, which frequently contains artificial components that may cause unintended side effects (10).

Types of cough syrup

- 1) Simple syrup
- 2) Medicated syrup
- 3) Flavoured syrup

Advantages of Herbal Cough Syrup

1. Absence of adverse consequences .
2. No Damage .
3. Easily accessible .
4. Simple to modify the dosage based on the weight of the child .
5. The patient can take it without assistance, and no nursing is needed.
6. For items like cough medications, the liquid dose form is used.
7. Herbs Grow in a public area.
8. Antioxidant by delaying the oxidation process that breaks down sugar into dextrose and cellulose.
9. Good patient compliance, particularly for paediatric patients because the test syrup is delicious.
10. It functions as a preservative by delaying the growth of mold, fungus, and bacteria due to osmotic pressure. (4).

List of Herbal Ingredients

1) Adhatoda Vasica



Fig No 1. Adulsa

Synonym : Adhtoda, Adulsa

Biological source :- It is dried and fresh leaves of Adhatoda vasica or Malabar nut.

Family : Acanthaceae.

Chemical Constituents:- Chemical components include adhatodic acid, 6-hydroxy vasicine, vasicinone, and vasicine.

Geographical Source: It is a widespread tiny evergreen sub-herbaceous found in India, Sri Lanka, Burma, and Malaysia, particularly in the lower Himalayas (up to 1300 meters above sea level).

Profile of the Plant: - Vasica Adhatoda Nees is a member of the Acanthaceae family of medicinal plants. It is an evergreen shrub with several long, opposing branches that grows one to three feet tall. Large, lance-shaped leaves are seen. Woody below and herbaceous above. Leaves are exstipulate and opposite. Tiny irregular zygomorphic, bisexual, hypogynous, and flower spikes or panicles. Its fruits are capsular and have four seeds. The flowers have two colours: purple and white.

Benefits :

- 1) The removal of intestinal parasites can be achieved with the use of Vasaka leaves, bark, fruit, and flowers.
- 2) Vasaka plant is used to treat asthma, chronic bronchitis, colds, and coughs.
- 3) Vasaka provides unwavering relief in the acute stages of bronchitis, particularly in cases where the sputum is thick and sticky.
- 4) It softens the sputum, making it easier to bring up.
- 5) The dried leaves should be smoked to relieve asthma.
- 6) When treating diarrhoea and dysentery, the juice from its leaves should be administered in dosages of two to four grams.

Uses

- 1) Expectorants .
- 2) In individuals with asthma and cough syrup.

2)Tulsi

Synonym : Tulas ,Tulsi

Biological source:- The sparkling and dried leaves of the ocimum sanctum Linn.

Family:- lamiaceae



Fig. No 2 Tulsi

Chemical components:- flavonoids, carvacrol, linalool, Eugenol, and oleanolic acid.

The plant tulsi, which is a member of the genus *Ocimum*, is well-known for its many medicinal uses. The leaves of tulsi are widely used to make Ayurvedic medication. Tulsi is used to treat a number of illnesses, including kidney stones, heart problems, headaches, and the common cold. Additionally, the Tulsi plant offers bug, fly, and mosquito protection.

Uses

1. Anti-tussive.

Health Benefits

1. Boosts immune device .
2. Shows Antitussive and antibacterial properties.
3. Treat breathing issues .
4. Help in dry and defensive cough.

3)Clove



Fig No 3. Clove buds

Synonym :- Clove flower, and Clove bud.

Family – Myrtaceae.

Biological source – It includes dried flower buds of *Eugenia caryophyllus*

Chemical Constituents:- Acetyl Eugenol, alpha and beta caryophyllene.

Plant Profile

The antibacterial and anti inflammatory features of clove are well-known, and they will assist lessen the signs of a dry cough. The heady fragrance of cloves is strong, warm, sweet, spicy, and barely astringent. They are wealthy brown in colour.

Uses :

1. In asthmatic patients.
- 2.Cough syrup.
- 3.Nasal decongestant.

4) Fennel

Synonyms: - Large Fennel, Sweet Fennel, Fennel fruit.

Biological source: - Fennel is the dried, ripe end result of *Foeniculum vulgare* Mill.

Family:- Apiaceae



Fig No 4. Fennel

Chemical Constituents:- Fennel carries volatile oil (2-6.5%) and fixed oil (12%). The predominant constituent of the volatile oil are phenolic ether, and the ketone, fenchone (18-20 %) which provide the fruit its wonderful odour and taste; the opposite parts of volatile oil are anisic aldehyde, anisic acid, α - pinene, dipentene and phellandrene .Fennel carries a combination of antioxidant, antimicrobial thing and inflammatory volatile oil, which assist alleviate the danger of cold, cough and flu and offer immediate relief.

Uses:-

- 1.Flavouring agents
- 2.It is likewise used to higher breathing tract contamination coughs, bronchitis, cholera.

5)Turmeric



Fig No 5. Turmeric

Synonym:- Indian saffron and haldi.

Family – Zingiberaceae

Biological source –Turmeric is the dried as well as rhizome of plant known as *curcuma longa* Linn.

Chemical Constituents :- curcuminoids (curcumin, demethoxycurcumin, and bisdemethoxycurcumin), and volatile oils containing compounds like turmerone and zingiberene, responsible for its colour and aroma.

Plant Profile:- Turmeric is a broadly used spice derived from the *Curcuma longa* root. It carries a substance referred to as curcumin, which can also additionally lessen swelling turmeric has a warm, sour flavour.

Health Benefits

1. Fights towards cough and cold.
2. Help menstrual discomfort .
3. Help to lessen irritation and breathing problems .
4. Improve digestion.

Extraction of herbal ingredients

1) *Adhatoda Vasica*



Fig No 6. Extraction of Adulsa

1. Fresh leaves of *A. vasica* have been harvested and punctiliously washed in distil water.
2. 50m of leaves have been macerated to stick with the assist of sterilized mortar And pestle with 50ml distil water and it changed into filtered thru muslin cloth.
3. The filtrate changed into saved frozen at 4°C and utilized in next experiments as inventory solution (4).

2) Tulsi

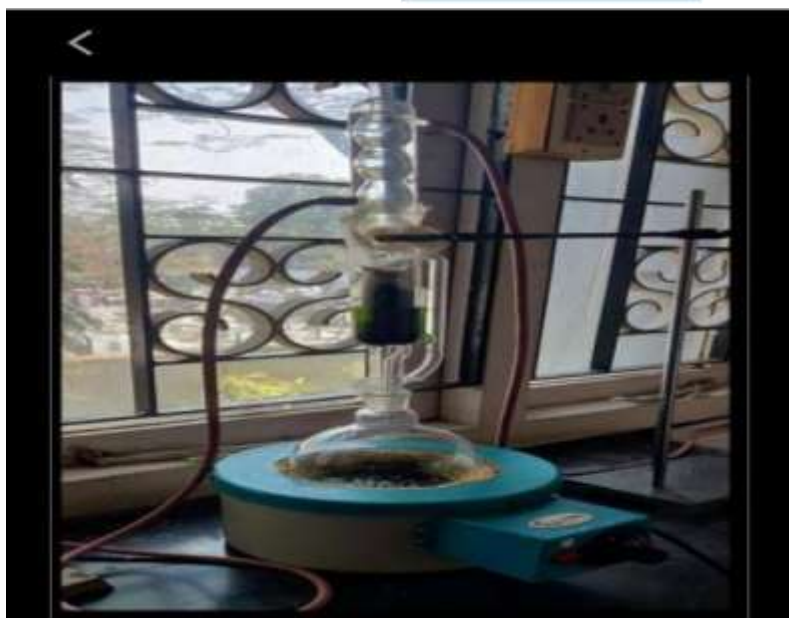


Fig No 7. Extraction of Tulsi

1. 25g of leaves have been weighted and positioned withinside the thimble of Soxhlet extraction .
2. Fill the Soxhlet extractor with 50ml of water and 50ml of ethanol measured the usage of a measuring Cylinder.
3. After coupling the device, a condenser unit became connected to an above water tank to accumulate growing Solvent vapour.
4. The warmth supply became a heating mantle at 80°C.
5. The solvent evaporated withinside the distillation path, thimble, and enlargement adapter, then condensed in The Soxhlet extractor's condenser unit.
6. The condensed vapour lower back to the thimble as liquid droplets, getting into touch with the pattern Inside. Extract 24 hrs.
7. After extraction, the extractor became eliminated and the extract became collected.
8. After extraction, the liquid became discharged right into a condenser to split solvent from oil extract.
9. The combination became distilled at 80°C till the Tulsi oil extract became absolutely solvent-free.(13)

3)Clove, Fennel and Turmeric



Fig No 8. Extraction of Clove Fennel and Turmeric

1. 5 to 7 grams of each herbal ingredient.
2. 500 ml of water were used to combine the herbs.
3. Attach the reflux condenser, and use a water bath to carefully boil the material for three hours.
4. Boil until the volume is one-fourth of what it was before. 5. After cooling, the liquid was filtered (4).

Method of Prepration Herbal Syrup



Fig No 9. Extract of herbal ingredients

- 1) Prepare 25 ml of sucrose base into a beaker.
- 2) Add 20 ml of Adhatoda Vasica extract, 5 ml of clove, 5 ml of fennel, 2 ml of turmeric, and 3 ml of turmeric.
- 3) Stir continually and gently side by side.
- 4) Once the syrup is prepared, transfer it into an amber bottle, label it, and keep it in a cool location.
- 5) The final herbal cough syrup was prepared and sent for evaluation test.

Formulation Table

Ingredients	F1	F2	Activities
Adhatoda Vasica	10 ml	10 ml	Antitussive
Tulsi	3 ml	3 ml	Antitussive
Funnel	3 ml	5 ml	Flavouring agent
Clove	5 ml	5 ml	Antimicrobial, Preservative
Turmeric	2 ml	2 ml	Anti inflammatory
Sucrose Base	25 ml	25 ml	Base

Evaluation Parameters

1)pH

1. 10 ml of the final syrup, precisely measured, were added in to a 100 ml volumetric flask, and the remaining capacity was filled with distilled water to reach 100 ml.
2. For roughly ten minutes, the solution was sonicated.
3. A digital pH meter was used to measure the ph.

2)Density

1. Cleaned the precise gravity bottle.
2. The bottle became wiped clean at the least instances with . distilled water.
- 3.Measured the weight of empty dry bottle syrup with stopper(w1)

4. The bottle became full of very last syrup and located the stopper, wipe out extra syrup from out of doors the tube.

5. Measure the weight in grams of syrup (w_2).

6. Calculate weight in grams of syrup (w_3).

7. Formula of density: Density of liquid under test (syrup) = weight of syrup under / volume of final Syrup under test = W_3/V .

3) Specific Gravity

1. Clean very well the particular gravity bottle with chromic or nitric acid.
2. Rinse the bottle at the least to a few instances with purified water.
3. If required, rinse the bottle with an natural solvent like acetone and dry.
4. Take weight of empty dry bottle with capillary tube stopper
5. Fill the bottle with distilled water and area stopper; wipe out extra liquid from facet tube the usage of Tissue paper (w_1).
6. Measure the Weight bottle with stopper and water on analytical balance (w_2).
7. Repeat the technique for liquid beneathneath check with the aid of using changing the water after emptying and drying as Mentioned in step 4 to 6.
8. Weight bottle with stopper and liquid beneathneath check on analytical balance (w_3). Formula for particular gravity: Specific gravity of liquid under test (syrup) = weight of liquid under Test / weight of water = w_3/w_2 .

Organoleptic Properties

1) Colour Examination

1. A watch glass was filled with a small amount of prepared syrup.
2. A watch glass in a white tube with a white background.
3. Colour could be seen with the unaided eye.
4. The outcomes of the syrup formulation batches' colour analysis. For the optimized batch, the formulation's colour was discovered to be greenish brown. For the F1 and F2 batches, the formulation's colour varies from greenish brown to dark brown.

2) Odour Examination

1. Each person took 2ml of the prepared syrup and sniffed it.
2. 2 minutes separated the two sniffs in order to counteract the effects of the first sniff
3. The findings derived from the syrup formulation batches' odour. For the F1 and F2 batches, respectively, the formulation had an aromatic smell.

3) Taste Examination

1. The tongue's taste buds were tested after a pinch of the finished syrup was taken.
2. The outcomes of tests conducted on syrup formulation batches. For batches F1 and F2, the formulation test was somewhat pungent, respectively.

Result

Parameters	F1	F2
pH	6	6.2
Density	1.57 mg/ ml	1.196 mg/ ml
Specific Gravity	1.131 kg / m ³	1.121kg/m
Organoleptic Properties		
Colour	Greenish Brown	Greenish Brown
Taste	Sweet	Sweet
Odour	Sweet Aromatic	Sweet Aromatic
Appearance	Turbid	Turbid

Conclusion

An historical time peoples use numerous plant, roots, and leaves for remedy numerous disease. Herbal cough syrup is an Ayurveda medication that's beneficial in lots of persistent fitness hassle together with cough, cold, fever, respiration contamination and problems amongst human. The gift studies have a look at method and assessment of natural cough syrup discovered a selected conclusion. The natural syrup used as an anti-tussive made on a lab scale. It may be administered as a liquid dosage form. Herbal syrup consisting of herbal herbs together with Adhatoda Vasica ,Tulsi, clove, fennel, turmeric, honey that have numerous movements and outcomes on treating acute or persistent cough and bloodless with expectorant and anti-tussive properties. The natural medication are displaying the much less facet outcomes in comparison to artificial cough syrup. In this have a look at ,I finish approximately natural cough syrup this is most secure natural medication that's used for remedy of cough and cold .

Reference

- 1)Nikhil Choudhary et.al , published on 3 March 2023, Herbal Cough Syrup: A Review , International journal of novel research and development (IJNRD), volume 8, Issue 3.
- 2) Chitmalwar Mahesh et.al , Published on December 2023, Comparative study of formulation and evaluation of herbal cough syrup: a review, International Journal of Research Publication and review, volume 4.
- 3) Mr. Godekar Dhananjay Pandurang et.al , April 2023, Review on Herbal Cough Syrup, International Journal of Research Publication and Reviews ,Vol 4, no 4, pp 3417-3423.
- 4)Darji Ayushiben Ganeshkumar et.al , Published on April 2024, Formulation And Evaluation Of Herbal Cough Syrup , International journal of Creative thoughts , Volume 12, Issue 4.
- 5) Miss Shrushti Hadpe et.al , Published on July (2024), Formulation and Evaluation of Herbal cough syrup, International Journal of Research Publication and Reviews, Vol (5), Issue (7),
- 6) Dr D. Umamaheswari et.al , published on June 2020, COMPARATIVE EVALUATION OF HERBAL COUGH SYRUP AVAILABLE IN MARKET, International Journal of Research and Analytical Reviews (IJRAR), Volume 7, Issue 2.
- 7) MISS. KHARADE SANDHYA A et.al , Published on April (2024), FORMULATION AND EVALUATION OF HERBAL COUGH SYRUP ,International Journal of Research Publication and Reviews , Issue (4), Page – 8040-8046.
- 8) Mr. Tanvir S. Rohokale et.al , Published on November-December 2023, Review on Formulation and Evaluation of Herbal Cough Syrup, International Journal for Multidisciplinary Research, Volume 5, Issue 6.

9) Disha Patel et.al, Published on September-October 2024, Formulation and Evaluation of Herbal Cough Syrup of Tulsi ny Using Molasses Base International Journal for Multidisciplinary Research, Volume 6, Issue 5.

10) Dhiraj Dilip Chavan et. Al Published on November-202, REVIEW ON POLY HERBAL COUGH SYRUP WITH PHARMACOLOGICAL ACTIVITY, International Research Journal of Modernization in Engineering Technology and Science, Volume:05/Issue:11.

