

Review On Polyherbal Cough Powder

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Abstract—A new review suggests that there is little evidence that such treatments provide any real efficiency, despite the fact that cough medications are currently among the most widely used over-the-counter medications in the world. A cough is an explosive, strong exhalation used to expel fluids and foreign objects from the tracheobronchial tract. The purpose of this review study was to compile information on the plants used in traditional culture and ethnobotany to treat and relieve cough, which is a common condition in both children and adults. The most typical issue that all people experience is a cough. There are two feathers of coughs dry cough and wet cough. A wet cough produces mucus and mucous, but a dry cough does not. The saccharinity is the most well- known and frequently used lozenge form for treating coughs and snap since it's simple for cases to take. The ideal of this study is to develop a herbal cough to check bacterial exertion of the excerpt of Nagarmotha, Pippali, Liquorice, Ginger, Amla. This study aims to develop an herbal cough powder while assessing the turbidity, colour, scent, and taste parameters in relation to variations in fast stability testing. Quality of the final herbal cough powder was evaluated utilising variables such as viscosity, pH, colour, both physical look and scent. Clove oil functions as an expectorant when it comes to treating respiratory conditions like colds, bronchitis, cough, asthma, and upper respiratory infection. Coughing is one of the most prevalent ailments that individuals in many countries deal with. Coughing is the body's defense mechanism. Since herbal powder makes patient compliance easier, it is a widely used and favored dose form for treating coughs. Recently, there has been a lot of interest in plant-derived chemicals and herbal medicines due to their wide range of potential use as medical plants. The market for medications made from plants is expanding. This study's primary goal was to remove dangerous synthetic ingredients from herbal cough medication. formulation and use safe, natural ingredients in their place. In India, the number of people suffering from asthma is rising daily for a variety of environmental factors. It helps those who have

congestion in their chests. The goal of the study is to create a pure herbal syrup and assess and contrast its physicochemical characteristics with those of commercially available synthetic and herbal powders.

Index Terms—antitussive, expectorant, dry cough, wet cough, adulsa, betel leaf, honey, turmeric, ginger, mentha ,tulsi, fennel, gum acacia.

I. INTRUCTION

Cough: -Coughing excessively may indicate the presence of an illness. There are non-infectious causes of cough in addition to viral diseases like the common cold. Coughing repeatedly causes discomfort and inflammation, which makes a person cough more frequently. Children typically get respiratory tract infections, some of which resolve on their own and carry a very low risk of complications. Cough is a protective reflex that helps to expel irritant matter and is necessary for preventing mechanical obstruction to breathing. It is most common symptoms affecting a large population and presenting to general practitioner. It can be associated with the pulmonary disease like common cold, pneumonia and chronic bronchitis. Up to 40% of patient with chronic cough remain unexplained in specialist clinics and are observed creating serious health problems. Both acute and chronic cough have significant impacts on health-related quality of life. Drugs that suppress Cough are designated as anti-tussive. Some of them act on the central nervous system to inhibit cough while others produce their effects locally. Centrally and peripherally acting anti-tussive produce known side effects such as sedation, constipation, drowsiness and addiction. Therefore, a need is felt to develop an effective anti-tussive and expectorant drug without any side effects

Categorization of Cough: Depending on the kind of Essentially, there are two kinds:

1) Dry cough: This type of cough occurs when the throat's mucus content is low or nonexistent. A dry cough typically feels like a tickle in your throat and doesn't generate any mucus or phlegm. Because it doesn't clear anything from your throat or lungs.

B) Wet cough: This type of cough is brought on by phlegm or mucus. Wet coughs are caused by infections such as the flu, common colds, and chest infections. It benefits our bodies. A chest infection might cause phlegm to cough up tiny bits of bright crimson blood. The lungs are the source of this blood. When fluid in the airways sets off the coughing reflex, a wet cough results. Given that it generates mucus, a productive cough is another term for a wet cough.

•Based on how long they last, there are three kinds:

A) Severe cough: [Shorter than three weeks]

Acute cough is characterized by a duration of no more than three weeks. The most common cause of it is a viral infection of the lower or upper respiratory tract (also known as the "common cold").

B) Sub acute: [3 -8 weeks]

Some infections can cause bronchial hypersensitivity that is permanent. B. Pertussis infection and pneumonia are the respiratory causes. Tourette's syndrome and GERD are examples of non-respiratory causes. A subacute cough is one that lasts for three to eight weeks.

C) Prolong cough: (greater than eight weeks) A chronic cough is defined as a persistent cough that, on some or most days, last for 8 weeks or more. while coughing can indicate a number of lungs disorders as well as certain non-lungs ailments.

Cough Mechanism: The cough reflex is the primary coughing mechanism. The cough reflex happens when dust or other foreign particles trigger cough receptors in the respiratory tract. This triggers a cough, which forces fast moving ove the foreign material from the respiratory tract before it ruches the lungs. This usually cleans the trachea and bronchi, which are the tubes that carry air from the mouth and nose in the lung tissue. Panicularly sensitive areas include the which is where the trachen splits into the bronchi at the bottom, and the larynx, or voice box.

II. HERBAL POWDER

A pharmaceutical powder is a mixture of finely divided drug or chemicals in dry form. These are solid dosage form of medicament which are meant for internal and external use. They are available in crystalline or amorphous form. The particle size of powder plays an important role in physical, chemical and biological properties of the dosage forms.

Introduction



Fig01.Herbal Powder

Herbal powder are finely ground formulations prepared from dried medicinal plants or their specific parts such as leaves, roots, bark, fruits, or seeds. These powders are one of the oldest and most convenient forms of herbal medicine, used in various traditional systems like Ayurveda, Unani, and Siddha. They are valued for their natural therapeutic properties, ease of administration, and ability to deliver multiple phytoconstituents in a single dose. Herbal powders can be used internally as churna or externally for applications such as face packs, wound healing, or poultices. Their preparation involves drying, pulverizing, and sieving the plant materials to obtain a uniform, stable, and effective product. The growing global demand for natural remedies has made herbal powders an important domain in modern herbal formulation and nutraceutical industries. Herbal powder (churna) is traditional herbal dosage form prepared by drying, pulverizing, and sieving medicinal plant material. It represents one of the oldest and simplest delivery system in herbal and Ayurvedic medicine. Herbal powder mentions in Rigveda and Atharvaveda. Plants like Haritaki, Ashwagandha, Somlata etc. is used as powder

Classification Of Herbal Powder: Herbal powder (churna) is a finely powdered form of crude drugs

obtained from plant, used in Ayurveda, Siddha, Unani and herbal system of medicine.

1) Single Herb Powder - (Ekadravya churna) Single herb powders (often referred to as Churna in Ayurveda) are a basic and simple form of herbal medicine consisting of a fine powder of a single plant part (leaves, roots, fruits, etc.). They are dried, ground, and used directly or incorporated into foods and beverages. Single herb powder is a dried, pulverized plant material obtained from a single medicinal plant, used for therapeutic and health-promoting purposes. Example amla churna, tulsi churna.



Fig 02. single herb powder

2) Polyherbal Herb Powder: - Polyherbal powder (Churna) is a finely powdered formulation that contains two or more medicinal herbs in specific proportions. It is widely used in Ayurveda, Siddha, Unani and herbal medicine systems to achieve synergistic therapeutic effects that cannot be obtained from a single herb alone. Polyherbal formulation refers to combining multiple herbs in a single preparation to enhance therapeutic efficacy, reduce toxicity, and target multiple disease pathways. Example. Triphala churna (amla, haritaki, bibhitaki)



Fig03.polyherbal herb powder

1. Characteristics of Herbal Powder: -

- 1) Finely powdered form of dried medicinal plants.
- 2) Free-flowing and uniform in particle size.
- 3) Stable when stored in a dry and airtight container.
- 4) Can be easily mixed with other powders or liquids.
- 5) Retains natural color, taste, and aroma of the plant.
- 6) Free from artificial chemicals or preservatives.
- 7) May be hygroscopic (absorbs moisture) if not properly stored.

2. Advantages Of Herbal Powder: -

- 1) Natural and safe – derived from plant sources with minimal side effects.
- 2) Easy to prepare and administer – can be taken directly or mixed with water, honey, or milk.
- 3) Cost-effective – economical compared to synthetic medicines.
- 4) Quick absorption – due to fine particle size.
- 5) Multi-component action – contains various phytochemicals offering synergistic effects.
- 6) Long shelf life – when properly dried and stored.
- 7) Versatile – suitable for internal and external use.

3. Disadvantages Of Herbal Powder: -

- 1) Less precise dosage compared to modern formulations.
- 2) Possible contamination by dust, microbes, or moisture if not stored properly.
- 3) Unpleasant taste or odor of some herbs.
- 4) Variation in quality due to differences in plant source or preparation method.
- 5) Short stability in humid conditions.
- 6) Slower onset of action compared to synthetic drugs.

4. Application-

- 1) Used as nutritional supplements and tonics.
- 2) Used for treatment of common ailments (e.g., cold, cough, digestive disorders, skin problems).
- 3) Applied externally for wound healing, skincare, and pain relief.
- 4) Used as detoxifying and rejuvenating agents in Ayurveda (e.g., Triphala churna).
- 5) Incorporated in cosmetic formulations (face packs, hair powders, scrubs).
- 6) Pharmaceutical industry – as raw material for tablets, capsules, and herbal syrups.

- 7) Cosmetic industry – in herbal creams, powders, and packs.
- 8) Food and nutraceuticals – as functional food ingredients or health supplements.
- 9) Traditional medicine – widely used in Ayurvedic, Unani, and Siddha preparations.

Mixing Of Powder: -

The powders may be mixed by any one of the following methods.

1. Spatulation
2. Trituration
3. Geometric dilution
4. Sifting
5. Tumbling

1.Spatulation: -

In this method, mixing of powders is done by the movement of a spatula throughout the powders on a sheet of a paper or on a porcelain tile.

The method is very useful in mixing: - (a) Small amount of powder.

(b) Solid substances that liquefy or form eutectic mixtures, when in close and prolonged contact with one another since very little compression or compact results. The method is not suitable for large quantities of powders or for powders containing one or more potent substances because homogenous blending may not occur.



Fig04.spatulation

4.Trituration: - It is used both to reduce particle size and mix powders. If particle size reduction is desired along with mixing of powders, a porcelain mortar with a rough inner surface is preferred to a glass mortar with a smooth working surface. A glass mortar may be preferred for chemicals that may strain a porcelain surface and for simple mixture of substances without

special need for comminution. A glass mortar cleans more readily after use.



Fig05.Trituration

3.Geometric Dilution: - The method is used when potent substances are to mixed with a large amount of diluent. The potent drug is placed upon an approximately equal volume of the dilute in a mortar and the substances are slightly mixed by trituration. A second portion of diluent equal in volume to the powder mixture in the mortar is added and trituration is repeated. The process is continued, adding diluent equal in volume to the mixture in the mortar at each step, until all the diluent is incorporated.

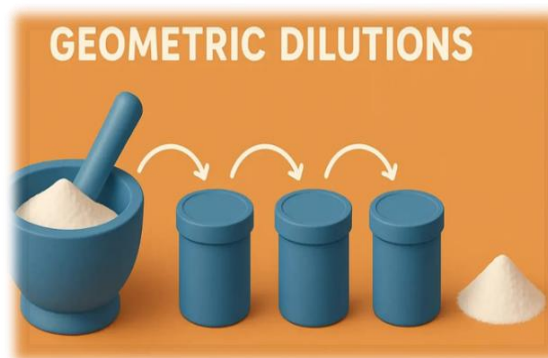


Fig06.Geometric Dilution

4. Sifting: -

The powders are mixed by passing through sifters. This process results in a light fluffy product and is generally not acceptable for incorporation of potent drugs into a diluent base.

5. Tumbling: -Tumbling is the process of mixing powders in a large container rotated by an electric motor. These blenders are widely employed in industry as large volume powder mixers.



Fig07.Tumbling

Packaging Of Powder -

Powders may be wrapped in paper or dispensed in bulk powder in a wide mouth container.

Wrapping of powders: Weigh the required number of powders and wrap in the papers. White glazed paper is generally used for wrapping the wrapping should be done on a clean tile or large sheet of a glazed paper to protect the product.

The powders are wrapped in the following manner: -

- (1) Cut the required number of powder papers in a suitable size ie. 120 mm x 100 mm.
- (2) Arrange the papers with their long edges parallel to the front of the bench and turn up the long edge of each paper to about one seventh of its width.
- (3) Weigh out the powder and place towards the front of the paper
- (4) Carry the front of the paper over to the turned-up edge (Fig 4.1d & c), bring the turn-up down and then fold this edge forward until it covers about two-thirds of the distance to the near edge of the packet.
- (5) Turn the edges of the packet under, using the powder folder (Fig 4.1g) so that the overlap is equal at both ends.
- (6) Firm the creases using a clean flexible spatula but avoid excessive pressure which would cause caking of enclosed powder.
- (7) The packets are arranged in pairs, flap to flap and restrained with an elastic band.
- (8) The wrapped powders are sent in an envelope if the number of powders is less than six. In case of large quantity, the boxes are preferred. In a well-wrapped powder, there should be no powder within the flaps or folds. When powder is opened, for administration, the powdered material should appear in the centre of the paper.

Double wrapping White glazed paper gives inadequate protection to volatile, hygroscopic and deliquescent substances unless it is lined with waxed paper. The lining is cut a few mm smaller each way than the white glazed paper and it is quite satisfactory to fold both papers together. In exceptional cases, each packet may be wrapped externally in aluminium foil. Labelling Patient should be instructed that individual powder should be dispersed in a little water or placed on the back of the tongue before swallowing.

Evaluation Test: -

1. Particle Size and Distribution

Affects dissolution, bioavailability, uniformity, flow, and mixing.

- Methods: Sieve Analysis (for coarse powders)

Laser Diffraction (for fine powders)

Microscopy/Image Analysis

2. Bulk and Tapped Density

- Bulk Density: Weight per unit volume without compaction.

Formula: weight of powder / bulk volume

- Tapped Density: Weight per unit volume after tapping the container to compact the powder.

Formula: weight of powder / tapped volume

3. Compressibility Index (Carr's Index)

- Formula: Carr's Index = $\frac{(\text{Tapped density} - \text{Bulk density})}{\text{Tapped density}} \times 100$

Carr's Index Flow Character

5–15% Excellent

16–20% Good

21–25% Fair

26–31% poor

4. Hausner Ratio

- Formula: Hausner ratio = $\frac{\text{Tapped density}}{\text{Bulk density}}$

Hausner Ratio Flowability

< 1.25 Good flow > 1.25 Poor flow

5. Angle of Repose

Angle between the surface of a powder cone and the horizontal surface.

Indicates flow properties.

- Formula: $\theta = \tan^{-1} (h / r)$ where, θ = angle
h = height of pile r = radius of base

6. Moisture Content

- Methods: Loss on Drying (LOD): Heat and weigh before/after.

Karl Fischer Titration: More accurate for low moisture.

Affects stability, flow, compressibility, and shelf life.

7. Solubility and Wettability

- Solubility: Determines how easily a powder dissolves in a solvent.
- Wettability: Ability of powder to absorb liquid and form a suspension.

8. Flow Rate Through an Orifice

- Method: Measure time taken for a known mass to flow through a funnel/orifice.
- Application: Evaluates suitability for capsule filling, tablet pressing, etc.

9. Chemical Composition & Assay

- Methods: Titration

UV-Vis Spectroscopy HPLC / GC (for purity and content)

- Checks: Active ingredient content, Degradation products, Impurities

10. Microbial & Contaminant Testing

- Tested for: Total viable count
Pathogens (e.g., E. coli, Salmonella) Heavy metals
Residual solvents

11. Stability and Hygroscopicity

- Stability: Powder stored under various ICH conditions (e.g., 25°C/60% RH, 40°C/75% RH) to assess: Physical changes, Chemical degradation
- Hygroscopicity: Tendency to absorb moisture from the environment.

12. Compactibility (Pharmaceutical-specific)

- Measures: Ability of powder to form strong, cohesive tablets under pressure.

13. Packaging Compatibility

Ensures powder does not react with or degrade due to packaging materials. Important for stability and shelf life. Here are a clear and well-structured explanation of Drying and its Types — useful for pharmacy, Ayurveda, and food science studies.

Drying- Drying is the process of removing moisture (water content) from a substance, usually by heat, airflow, or desiccation.

Types Of Drying: Drying is a process that dehydrates food to prevent microbial growth. Drying removes moisture from food. The lack of moisture inhibits the growth of bacteria, yeasts, and molds.

Properly dried and stored foods are shelf-stable, meaning they are safe to store at room temperature.

1) Heated air drying: -a) sun drying d) solar drying

b) shade drying e) fluid-based drying

c) spary drying

2) Osmotic Drying

3) Vacuum Drying

4) Drum Drying

5) Freeze Drying

a) Sun Drying - Sun drying is a traditional method for reducing the moisture content of paddy grains. This process involves spreading the grains under the sun. Solar radiation heats the grains and the surrounding air. The heat increases the rate of water evaporation from the grains. This method is used to reduce the moisture content of paddy.



Fig08.Sun drying

b) Shade Drying- Shed drying is a method of drying products without direct contact with the sun. This method is used for certain products, such as onions, that would otherwise become "boiled" and develop a bad smell if dried in direct sunlight for too long. Shed drying is a process where products are dried without direct sun exposure. Some products cannot be dried in direct sunlight or air for extended periods.



Fig09.Shade drying

c) Spray Drying :- Spray drying is a process that creates a dry powder from a liquid or slurry by using a hot gas. It is often used for heat-sensitive materials like foods and pharmaceuticals, or materials that need a very consistent and fine particle size.

Method: A liquid or slurry is rapidly dried with a hot gas to produce a dry powder.

d) Solar Drying :- Solar drying may be defined as the drying process in which the object's products get in a chamber in which the solar light passes and the products gained heat and the using special characteristics the heat doesn't release from there in the result of a higher drying rate.

e) Fluid Base Drying :- A fluidized bed dryer (also called a fluid bed dryer) is a kind of equipment used extensively in the pharmaceutical industries to reduce the moisture content of pharmaceutical powder and granules. The equipment works on a principle of fluidization of the feed materials. In the fluidization process, hot air is introduced at high pressure through a perforated bed of moist solid particulate. The wet solids are lifted from the bottom and suspended in a stream of air (fluidized state). Heat transfer is accomplished by direct contact between the wet solid and hot gases. The vaporized liquid is carried away by the drying gasses. Sometimes to save energy, the exit gas is partially recycled

2) Osmotic Drying: - Osmotic dehydration is accomplished by placing foods such as fruits and vegetables into concentrated soluble solid solutions having higher osmotic pressure and lower water activity. The difference in the chemical potential of water between the food and the osmotic medium is the driving force for dehydration. Compared to other conventional methods, osmotic dehydration treatment is a simple procedure that requires no mechanical aid and involves decreased cost of energy. It is easy to perform at room temperature, which ensures the retention of color, texture, and nutrients with limited loss of volatile compounds and oxidative.

3) Vacuum Drying: -Vacuum drying is the mass transfer operation in which the moisture present in a substance, usually a wet solid, is removed by means of creating a vacuum. In chemical processing industries like food processing, pharmacology, agriculture, and textiles, drying is an essential unit operation to remove moisture. Vacuum drying is generally used for the

drying of substances which are hygroscopic and heat sensitive, and is based on the principle of creating a vacuum to decrease the chamber pressure below the vapor pressure of the water, causing it to boil. With the help of vacuum pumps, the pressure is reduced around the substance to be dried. This decreases the boiling point of water inside that product and thereby increases the rate of evaporation significantly. The result is a significantly increased drying rate of the product. The pressure maintained in vacuum drying is generally 0.03-0.06 atm and the boiling point of water is 25-30 °C.

Disadvantages of vacuum drying:-

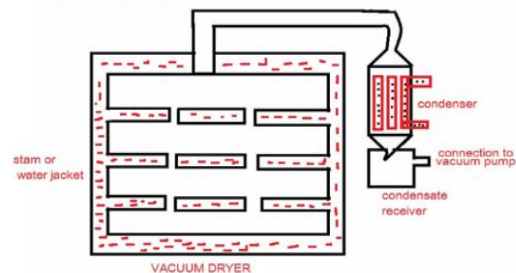
Vacuum drying is a batch process with low efficiency.

Vacuum dryers are expensive.

They require skilled labor to operate.

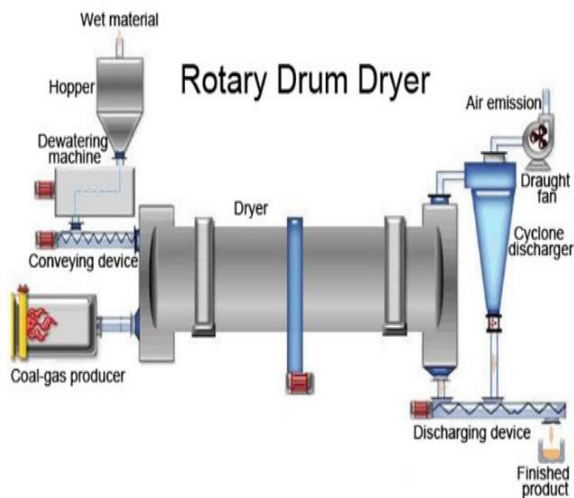
Maintenance costs are high.

VACUUM DRYER



4) Drum Drying: -The drum dryer is commonly used to dry viscous, concentrated solutions, slurries or pastes on rotating steam-heated drums. 1,2 It can also be used to dry concentrated solutions or slurries that become more viscous or pasty because of flashing or boiling off of moisture or of irreversible thermochemical transformations of their content that occur on their first contact with the hot drum surface.3-5 The viscous slurry or paste is mechanically spread by the spreading action of two counter-rotating drums into a thin sheet that adheres on the hotter drum in single drum dryers or split sheets on both hot cylinders in double drum dryers. The adhering thin sheet of paste is then rapidly dried conductively by the high heat flux of the condensing steam inside the drum. For very wet slurries that produce wet sheets, the drying of the wet thin sheet can be further enhanced by blowing hot dry air on the sheet surface. The thin sheet containing heat-sensitive materials, such as vitamins, can also be dried

at a lower temperature in a vacuum. The irreversible thermochemical transformations during the slurry's first contact with the hot drum can also be used to simultaneously impart certain required quality of the dried product. Starch slurries can be gelatinized or "cooked" before the sheet is dried to produce pregelatinized or "precooked" starch for instant food formulations. Exposure of the thin sheet to the high heat flux and high temperature for a short period of time can also impart a porous structure to the dried sheet because of the rapid formation of vapor bubbles within the sheet during "boiling like" drying.



5)Freez Drying: -Freeze Drying is a process in which a completely frozen sample is placed under a vacuum in order to remove water or other solvents from the sample, allowing the ice to change directly from a solid to a vapor without passing through a liquid phase. This process, called sublimation, along with the minimal heat input that is required, is ideal because of the long-term preservation properties it provides to the integrity of the sample's biological and chemical structure.



Fig10.Freez Drying

III. LITERATURE REVIEW

1) Bali Chouhan (2013) -Triphala: A compressive ayurvedic review this review conclude that the triphala 1:2:4 formulations contain a higher proportion of oxidants of like T. bellerica, T. chebula and E. officinalis (rasayana) which would be responsible for significant effect on hyperlipedemia against triphala 1:1 formulation.

2)Neethu S. Kumar Arun S Nair, Anju M Nair Megha Murali (2016) -This review article focuses on pharmacological & therapeutic effects of triphala. Triphala is rich in antioxidant, Posses antibacterial anti-viral, anticancer property, is also known to cure cataract and effective in treatment of Acquired immune deficiency syndrome (AIDS). Triphala is most well-known for its gentle effect on the bowels improving peristalsis and cleansing toxic build up of waste, but Ayurveda also views Triphla as a nourishing supplement known for its ability to rejuvenate healthy tissues, allowing one to age gracefully and that is why Triphlo is also termed as 'nectar' of life.

3) Princy A, Anju G, Rajat V. (2018)-This research article on comparative quality assessment of three different marketed brands of Indian polyherbal formulation Triphala churna. It concludes that all parameters of three brands of Triphala churna had approximately similar values and were compatible with standard values mention in pharmacopoeia except that there was a considerable difference between the flow properties of powder of all three brands.

4) Nair Sk, Shivaprasad BM (2018):Triphala a miracle herb in the field of dentistry as per this review triphala used oral and periodontal Diseases, root canal irrigant and also used as a mouth rinse. According to Sushruta Samhita, the triphala herb can be used as a gargling agent in dental diseases.

5) Revathi S, (2018) - Review on Triphala the sanctifying medicine to human domain. Triphala is relegated as a " tridoshic rasayana" implying that the energetic is relevant for body humors vaata, pitta and kapha for a wide range of patients.

6) Venkatachalam G, Ganapthy S. Babu AMSS (2019)- In this study a Prepared Triphala churna was comparatively standardized with the references obtained from market from all evaluation & standardization it proved & conclude that Triphala extracts may be used for Various Ayurvedic preparation to chronic diseases like cancer.

7) Wiraphol Phimarn (2021) - Review article on effect of Triphala on lipid and glucose profile based on this review, the Triphala formula was effective on the reduction of lipid profile and blood glucose level.

8) Suhail Ahmed, Alok Sharma (2021) - Review on exploring scientific validation of triphala rasayana in ayurveda as a source of rejuvenation for contemporary healthcare.

AI To prepare a standardized polyherbal cough powder by selecting herbal raw material .

IV. OBJECTIVES

1. To promote human health by providing natural plant-based therapeutic benefits.
2. To support the body's immunity using herbs rich in antioxidants and bioactive compounds.
3. To help prevent common diseases through regular use of safe, natural herbal ingredients.
4. To improve digestion and metabolism using herbs that enhance gastrointestinal health.
5. To supply essential nutrients such as vitamins, minerals, and phytochemicals present in herbs.
6. To detoxify the body naturally by improving liver, kidney, and digestive functions.
7. To manage mild health conditions like cough, cold, acidity, inflammation, or stress.
8. To provide a safe alternative to synthetic medicines with fewer side effects.
9. To supply essential nutrients such as vitamins, minerals, and phytochemicals present in herbs.
10. To detoxify the body naturally by improving liver, kidney, and digestive functions.
11. To manage mild health conditions like cough, cold, acidity, inflammation, or stress.
12. To enhance overall well-being by balancing the body's natural physiological processes.
13. Use of herbal ingredients shows non irritating and any side effects

V. MATERIALS AND METHODS

Ingredients	Role
Betel Leaf	Antioxidants, anti-inflammatory
Tulsi	Antitussive, Antibacterial
Ginger	Antitussive, Expectorant
Adulsa	Cooling, Antitussive
Turmeric	Pain relief
Mentha	Soothing effect, Expectorant
Fennel	Flavouring agent
Gum Acacia	Binding agent, Demulcent property

VI. METHOD OF PREPARATION OF TRIPHALA POLYHERBAL POWDER (TRIPHALA CHURNA)

Haritaki (*Terminalia chebula*) – 1 part

Bibhitaki (*Terminalia bellirica*) – 1 part

Amalaki (*Emblica officinalis*) – 1 part

1. Selection of Raw Materials: Select dried, mature, authenticated fruits of Haritaki, Bibhitaki and Amalaki.

Ensure all raw drugs comply with identity, purity, and quality standards.

2. Cleaning: Remove foreign matter like dust, dirt, stones, fibers, or insect-damaged parts as per API standards.

3. Drying: Shade-dry each fruit separately to preserve heat-sensitive constituents such as vitamin C in Amalaki.

Moisture content should be within pharmacopoeial limit (<10%).

4. Size Reduction: Break fruits into small pieces.

Grind each fruit separately to obtain a coarse powder.

5. Pulverization: Pulverize each coarse powder to a fine powder using a grinder or pulverizer.

Recommended particle size: Sieve #80 (Ayurvedic Pharmacopoeia standard for churna).

6. Sieving: Pass each powdered drug through fine mesh to ensure uniform particle size distribution.

7. Mixing: Mix equal parts (1:1:1) of Haritaki, Bibhitaki, and Amalaki fine powders.

Ensure uniform blending to obtain a homogeneous Triphala churna.

8. Packaging: Pack the final product in airtight, moisture-proof, light-resistant containers.

Label with batch number, manufacturing date, and storage directions.

9. Storage: Store in a cool, dry place, away from sunlight and moisture to prevent oxidation and loss of phytochemicals.

1) Betel Leaf -The betel leaf is an evergreen and perennial, creeper, with glossy heart-shaped and white catkin. The genus Piper (Piperaceae) is largely distributed in tropical and subtropical regions of the world. Piper betel is cultivated in India, Sri Lanka, Malaysia, Indonesia, Philippines, Island, and East Africa.



Fig 11. Betel leaf

Macroscopic Characters of Betel Leaf: -

Shape: Heart-shaped (cordate) with pointed tip.

Colour: Dark green to yellowish -green, with glossy, shiny surface.

Size: 7-15 cm long and 5-14 cm width.

Surface: Smooth and glossy

Margine: Entire (smooth)

Apex: Acuminate (tapering to a point)

Base: Unequal base or cordate with lobes.

Flowers: Small, inconspicuous, and greenish -white, often clustered in spikes

Fruits: Small, round berries that are not typically consumed.

Odour: Aromatic, with a distinctive and pleasant smell.

Taste: Aromatic, with a taste that can range from sweet to punget or spicy.

Common Name:

Sanskrit: Tambool, Mukbhusan

Hindi: Paan

Marathi: Khauch paan.

Significance Of Betel Leaves:

- 1) Guna (quality): Laghu Ruksha
- 2) Rasa (taste): Tikt
- 3) Vipak (metabolism): Katu
- 4) Virya (potency): Ushan
- 5) Prabhav (impact): Hridya

Chemical Constituent Of Betel Leaf Leaves contain protein 3-3.5%, carbohydrate 0.5-6.10%, minerals 2.3-3.3%, and tannins 0.1- 1.3%. It contains calcium, phosphorus, iron, iodine, potassium, vitamin B, vitamin C and vitamin A. It also contains some aromatic compounds and stable oils like phenol and terpene. Besides, it contains eugenol, chavibetol apinene, f pinene, 1, 8 cineole and hydroxychavicol. Major constituents of common betel were found to be saffrole (48.7%) and chavibetol acetate (15.5%). The presence of allylpyrocatechol, caryophyllene, anethole, stearic acid, carvacrol, polyphenol, alkaloids, saponin, are also found in betel Leaf.

Uses Of Betel Leaf

- 1)Antimicrobial → It acts as preservative .
- 2)Anti-oxidants → Protect cell against free-radical
- 3)Anti-fungal → Fight against skininfections.
- 4)Anticancer → Inhibit cell proliferation .
- 5)Anti-inflammatory → It helps heal wound .
- 6) Anti-diabetic → Control blood sugar level .



2)Tulsi:-Holy basil or tulsi (scientific name: Ocimum tenuiflorum) is a medicinal herb that originates from India and has since been cultivated across East Asia, Australia and the surrounding tropics. The term “holy basil” gets its name because of its sacred classification among those who belong to the Vaishnavite sect of Hinduism.Unlike traditional basil, which is often used in culinary cooking and has its own set of benefits, tulsi has a rich history as a core component in the medicinal practices of Ayurveda. “Tulsi has been used for thousands of years in India and Nepal for its medicinal properties,” says Peart. “It’s been called ‘The Elixir of Life,’ ‘Liquid Yoga’ and ‘Queen of the Herbs,’ and it’s listed in the Journal of Ayurveda and Integrative Medicine for its many benefits.” family: Labiatae.



Fig. 12 Tulsi powder

Macroscopic Characteristics Of Tulsi :-

Shape: Square in cross section
 Surface: Hairy
 Size: 2-4 cm long
 Height: Reaches 30-75 cm in height
 Apex: Acute
 Leaves shape: Oblong to ovate, pointed
 Margine: Entire
 Colour: Green, though some varieties can be purplish.
 Odour: Strongly Aromatic.
 Taste: Mildly pungent.
 Fruit: Small, pale brown or red
 Seeds: Reddish -black

Common Names of Tulsi:

- 1) Marathi: Tulas, Tulsi
- 2) Hindi: Tulsi
- 3) Sanskrit: Vrinda, Shritulasi

★ Uses Of Tulsi: -

- 1) Antimicrobial: - Active compound like eugenol show antibacterial, antifungal and antiviral activity
- 2) Antioxidant: - protects cells from oxidative stress due to presence of flavonoids
- 3) Anti-inflammatory: - reduces inflammation in condition like arthritis.
- 4) Immunity Booster: - enhance immune response & protects from infections.
- 5) Adaptogenic (stress-relief): - reduce mental stress and supports adrenal functions .
- 6) Respiratory Health :- used in cough, cold , asthma, bronchitis due to expectorant and bronchodilator action.
- 7) Antidiabetic :- Lowers blood glucose and improves lipid profile .
- 8) Anticancer :- exhibit chemoprotective properties .

Chemical Constituent Of Tulsi:-

Tulsi contains volatile oils (Eugenol ,linalool , caryophyllene) , flavonoids (Apigenin, Luteolin) , [triterpenoids \(ursolic acid \)](#) [phenolic acid \(Rosmarinic acid \)](#) ,saponins , tannis and [trace alkaloids](#)

Significance Of Tulsi :-

Kasa (cough) , Shwasa (asthma) , Jwara (fever) , Agnimandya (loss of appetite)
 Used in PANCHANG (root, stem, leaves, flowers, seeds)
 Essential ingredient in – Kadha
 Chyawanprash
 Herbal teas & churnas

3) Ginger :- Ginger is in the family Zingiberaceae. Ginger originated in Maritime Southeast Asia and was likely domesticated first by the Austronesian peoples. Ginger is one of the first spices to have been exported from Asia, arriving in Europe with the spice trade, and was used by ancient Greeks. The distantly related dicots in the genus *Asarum* are commonly called wild ginger because of their similar taste. Ginger has been used in traditional medicine in China, India and Japan for centuries, and as a modern dietary supplement. Ginger may offer benefits over placebo for nausea and vomiting during pregnancy but there is no good evidence that it helps with nausea during chemotherapy. It remains uncertain whether ginger is effective for treating any disease. The ginger powder is the Creamy Yellow coloured powder extracted and grounded from the dried ginger rhizome. It possesses an intense aroma and a sharp, spicy flavour resembling the natural ginger taste profile. The free-flowing flavouring powder is an easy addition to instant food products with zero spoilage. It's because the powder preserves the characteristic scent and retains the nutritional components of ginger without creating any lumps.



Fig13. Ginger powder

Macroscopic Characteristics Of Ginger :-

Shape: Irregularly branched, laterally flattened rhizomes ,consisting 3-5 like branch

Size: Length 5-15 cm , thickness 1-1.5 cm .

Surface: Longitudinally striated with scars of rootlets and circular rings .

Fracture: Short and fibrous .

Colour: Externally buff to pale brown ; internally yellowish -white .

Odour: Strong , aromatic and characteristic .

Taste: Pungent and slightly sweet due to gingerol compounds .

Texture: Hard and compact when dry ; smooth when fresh .

Common Name Of Ginger :-

1)Sanskrit Name : Sunthi

2)Hindi Name: Adrak , Sonth (Dried Form)

3)Marathi Name: Ale

Uses Of Ginger :-

3. Anti-inflammatory & Analgesic :Reduces pain and inflammation in arthritis and muscular pain due to presence of gingerol and shogaol.

4. Antimicrobial:- Exhibits antibacterial and antifungal activity, useful in respiratory infections and sore throat.

5. Antioxidant :- Protects against oxidative stress; improves immunity.

6. Antitussive :-Used in cough syrups and home remedies to relieve sore throat and cough.

7. Hypolipidemic & Cardioprotective:- Helps reduce blood cholesterol and improves blood circulation.

8. Antispasmodic Relieves:- abdominal cramps and menstrual pain.

9. Carminative & Digestive :- Stimulate saliva and digestive juice secretion.

10. Antiemetic effect :- Prevent nausea and vomiting .

Chemical Constituent Of Ginger :- 1) Zingiberene (35-40 %)

2) Cineole

3) 6-Gingerol

4) Zingerone (degradation product of gingerol)

5) Resins (4-7 %)

6) Starch (40-60 %)

7) Lipids (6-8%)

Other (Non-Medicinal) Uses :-

1)Used as a spice and flavoring agent in food and beverages.

2)Important ingredient in Ayurvedic and Unani preparations (e.g., Trikatu churna).

3)Used in tea, confectionery, and bakery products for its aroma and taste.

4) Widely used in Indian and international cuisines to add aroma and pungent taste to curries, pickles, sauces, soups, bakery items, and beverages.

5) Beverage Industry Used in preparing ginger tea, ginger ale, ginger beer, and ginger-flavored soft drinks. Also added to herbal health drinks for its refreshing flavor.

6) Food Preservation Has natural antimicrobial activity, which helps in preserving foods and preventing spoilage.

7)Confectionery & Bakery Used in biscuits, cakes, candies, and jams for flavoring .

8)Perfumery & Cosmetics Ginger oil is used in perfumes, soaps, creams, and lotions for its warm, spicy fragrance

9) Agricultural Used in organic farming as a natural pesticide and antifungal agent due to its bioactive compounds.

10) Beverage Flavor Enhancer Added to juices, herbal teas, and cocktails for its distinctive spicy flavor.

11) Industrial Use Extracts used in food flavoring, essence, and perfumery.

4)Adulsa :- In Ayurvedic and Unani medicine, Adhatoda vasaka (L.) Nees is a well-known plant medication. It has been used to treat a variety of diseases and disorders, notably those affecting the respiratory system. vasaka as a herbal medicine. Family Acanthaceae.Adulsa is a tiny, evergreen. perennial shrub that grows to about three metres in height. Adulsa powder, also known as Malabar nut or Vasa, is a traditional herbal remedy with numerous potential health benefits. It is commonly used to treat respiratory issues like cough, cold, and asthma by helping to loosen mucus and open airways. It is also known for its anti-inflammatory properties, which may help reduce pain and swelling, and can be taken as a tea or mixed with water, juice, or smoothies. Botnical name Justicia adhatoda.



Fig 14. Adulsa powder

Macroscopic Characteristics Of Adulsa :-

- 1) LEAF: - Shape: Lanceolate
Size : 10-15cm long , 3-5 cm broad
Colour: Upper surface (dark green) , Lower surface (pale green)
Taste: Bitter
Odour: Slightly Aromatic.
- 2) STEM :- Surface: Smooth or slightly rough
Colour : Brownish -green to brown .
Nature : Woody and erect .
Branching: Opposite
- 3) FLOWER: - Colour: White with purple or pink streaks .
Arrangement: Dense, short spikes .
- 4) FRUIT:- Type: Capsule
Shape: Club-shaped , about 1.5-2 cm long
Seeds: 4 number , rounded
Colour : Light brown

Common Names Of Adulsa: -

Sanskrit Name: Vasa , Vasaka

Hindi Name: Adulsa , Arusa

Marathi Name: Adulsa

English Name: Malabar Nut

Significance Of Adulsa\ Vasaka :-

Adulsa Powder Is Widely Used In Ayurvedic Respiratory Formulations Like Vasavaleha , Kantakari Avaleha And Sitopaladi Churna . It Is Considered One Of The Best Natural Herbal Expectorant And Anti Tussive Agents In Ayurveda .

Chemical Constituents Of Adulsa :-

Alkaloids: Vasicine, Vasicinone, Vasicol, Adhatodine, Peganine

Flavonoids: Kaempferol, Quercetin, Luteolin

Essential Oils : Minor Volatile Oils Present

Tannins: Polyphenolic Compound

Saponins: Lycosides Producing Jam In Water

Uses Of Adulsa:-

- 1) Respiratory system: Expectorant, bronchodilator, useful in cough, asthma, and bronchitis
- 2) Anti-inflammatory: Reduces inflammation in respiratory and throat infections
- 3) Antimicrobial: Effective against bacterial infections
- 4) Antioxidant: Protects cells from oxidative stress
- 5) Febrifuge: Helps reduce fever
- 6) Blood purifier: Improves overall detoxification

Non-Medicinal Uses Of Adulsa :-

- 1) Adulsa leaf extract is used as a biopesticide to control crop pests such as aphids, whiteflies, and caterpillars
 - 2) It contains alkaloids (like vasicine) that act as natural insect repellents.
 - 3) Farmers use aqueous or alcohol extracts as eco-friendly alternatives to chemical pesticides
 - 4) Burning dried Adulsa leaves or using leaf extract acts as a natural mosquito repellent due to its aromatic and insecticidal compounds.
 - 5) Used in herbal formulations, cosmetics, and green pesticides industries.
 - 6) The plant's dense roots help prevent soil erosion on slopes and in loose soil areas.
- 5) Turmeric:- Turmeric (*Curcuma longa*) and several other species of the curcuma genus grow wild in the forests of Southern Asia including India, Indonesia, Indochina, nearby Asian countries . All of these areas have traditional culinary and medicinal uses going back to pre-history. In the Indian Ayurveda system of herbal medicine, turmeric is known as strengthening and warming to the whole body. Traditional uses in India include to improve digestion, to improve intestinal flora, to eliminate worms, to relieve gas, to cleanse and strengthen the liver and gallbladder, to normalize menstruation, for relief of arthritis and swelling. as a blood purifier, to warm and promote proper metabolism correcting both excesses and deficiencies, for local application on sprains, burns, cuts, bruises, insect bites and itches, for soothing action in cough and asthma, as antibacterial and anti-fungus, and in any condition of weakness or debility. " Turmeric is eaten as a food both raw and cooked throughout Asia. While turmeric root looks much like ginger root, it is less fibrous and is more chewable, crunchy, and succulent. The fresh root (not the powder) has a somewhat sweet and nutty flavor mixed with its bitter flavor. In modern times, the most

common use is of the dried root powder as the base of most curries in India and other nearby countries.



Fig15 turmeric powder

Turmeric is a vibrant yellow herbal powder derived from the *Curcuma longa* plant, primarily used as a spice and a traditional medicine due to its potent antioxidant and anti-inflammatory properties, largely attributed to the active compound curcumin. Family Zingiberaceae

Macroscopic Characteristics Of Turmeric: -

Shape: Cylindrical or oblong with short branches from central rhizomes .

Size: Length 2-8 cm , Diameter 1-2 cm

Surface: Rough and marked with roots scars and ring . surface is waxy and smooth .

Colour : Externally yellowish -brown, Internally orange yellow to reddishyellow

Odour: Characteristics ,aromatic, and pleasant .

Taste: Slightly bitter , pungent and earthy

Texture: Hard and compact

Fracture: Short and fibrous

Common Names Of Turmeric :-

Sanskrit Name:Haridra

Hindi Name: Haldi

Marathi Name:Halad

English Name:Turmeric

Chemical Constituents Of Turmeric :-

Turmeric's main chemical constituents are curcuminoids, such as curcumin, demethoxycurcumin, and bisdemethoxycurcumin, which are responsible for its yellow color and antioxidant properties. The other major component is

its essential oil, a volatile oil that contains various terpenoids.

Significance Of Turmeric :-

1)Medicinal: Anti -Inflammatory , Anti-Oxidant ,Antimicrobial

2)Nutritional : Natural Food Colorant And Preservative .

3)Cosmetic: Used For Skincare .

4)Cultural: Symbol Of Purity And Auspiciousness .

Uses Of Turmeric :-

1. It is a natural antiseptic and antibacterial agent, useful in disinfecting cuts and burns.

2. When combined with cauliflower, it has shown to prevent prostate cancer and stop the growth of existing prostate cancer.

3. Prevented breast cancer from spreading to the lungs in mice.

4. May prevent melanoma and cause existing melanoma cells to commit suicide.

5. Reduces the risk of childhood leukemia.

6. Is a natural liver detoxifier.

7. May prevent and slow the progression of Alzheimer's disease by removing amyloid plaque buildup in the brain.

8. May aid in fat metabolism and help in weight management.

6)Mentha : Mint or mentha belongs to the Lamiaceae family, which contains around 15 to 20 plant species, including peppermint and spearmint. It is a popular herb that can be used fresh or dried in many dishes and infusions. Manufacturers of toothpaste, gum, candy, and beauty products often use mint oil.Using fresh mint and other herbs and spices in cooking can help add flavor and reduce sodium and sugar intake.Throughout history, people have used different species of mint plants in medicine. Different types of mint plants offer a range of antioxidant qualities and potential health benefits, especially for people who have irritable bowel syndrome (IBS). Mint is a calming herb that people have used for thousands of years to help soothe an upset stomach or indigestion.Mint powder is dried and ground mint leaves used as a versatile ingredient in cooking and for its potential health and skin benefits.There are three chief species of mint in cultivation and general use: Spearmint (*Mentha viridis*), Peppermint (*M. piperita*),

and Pennyroyal (*M. pulegium*), the first being the one ordinarily used for cooking.



Fig16. Mentha powder

Shape: Leaves are simple, opposite and oblong

Size: Leaves are 2-5cm long and 1-2 cm wide

Surface: Upper surface (smooth or slightly hairy) Lower surface (contains oil glands)

Colour: Fresh leaves (bright green), dried leaves (green to dark)

Odour: Strong, aromatic and characteristics, menthol like odour

Taste: Pungent, cooling, and aromatic taste

Texture: Soft, slightly brittle when dry.

Common Name Of Mentha :-

Sanskrit Name: Pudina-Patra, Phudina

Hindi Name: Pudina

Marathi Name: Pudina

English Name: Mint

Uses Of Mint(Mentha):-

1) Digestive aid Relieves indigestion, gas, bloating, and nausea. Stimulates secretion of digestive enzymes.

2) Carminative & antispasmodic Reduces intestinal cramps and colic pain.

3) Antiseptic & antimicrobial Effective against bacteria, fungi, and viruses due to menthol and menthone.

4) Expectorant & decongestant Used in cough, cold, sinusitis, and asthma for relieving nasal congestion.

5) Analgesic Menthol provides a cooling effect and acts as a mild local anesthetic in headaches and muscle pain.

6) Antiemetic Used to prevent vomiting and motion sickness.

7) Antipyretic Provides a cooling sensation and helps reduce fever.

8) Antioxidant Protects cells from oxidative damage.

9). Pharmaceutical Uses:

Toothpaste, mouthwash, and throat sprays. Pain relief balms, ointments, and liniments.

10) Culinary Uses: Fresh and dried leaves used in chutneys, teas, salads, sauces, and beverages.

11). Cosmetic Uses: Added to creams, soaps, lotions, perfumes, and shampoos for its fragrance and cooling property. Used in skin-care formulations to soothe irritation and acne.

9) Fennel :- Fennel is a vegetable with a licorice-like flavor. It contains potassium, magnesium, and other nutrients with an antioxidant effect. Benefits of fennel may include supporting digestion and preventing skin damage. *Foeniculum vulgare*, or fennel, has a pale bulb and long green stalks. It can grow almost anywhere. All parts of the fennel plant, including the bulb, stalk, leaves, and seeds, are edible. In this article, we detail the health benefits and nutritional content of fennel. Fennel herbal powder, made from ground fennel seeds, is used both in cooking and for its traditional medicinal benefits, such as improving digestion and acting as an antioxidant. It can be added to savory dishes, baked goods, and drinks to add a sweet, anise-like flavor. Due to its anti-inflammatory and antioxidant properties, it may support overall wellness, and in Ayurvedic medicine, it is used to balance Pitta and Kapha doshas. Family: Apiaceae



Fig17. Fennel powder

Macroscopic Characteristics Of Fennel :-

Shape: Small, elongated, and oval. Slightly curved or drum-shaped.

Size: Length: 3–8 mm Width: 1–2 mm.

Colour: Greenish yellow, pale green, or yellowish brown.

Surface: Smooth and striated/ ridged.

Odour: Aromatic, sweet, and characteristic. Strong smell of anethole.

Texture: Hard but easily crushable. Oily feeling due to volatile oil.

Taste: Sweet, pleasant, slightly spicy. Cooling flavour.

Chemical Constituents Of Fennel:- Volatile Oil (1–4%) .The main active component of fennel. Major constituents Anethole (50–70%), Fenchone (10–20%), Estragole (5–10%), Limonene , α -pinene , β -pinene ,Camphene , Myrcene. Fixed Oil (12–18%) .Mainly oleic acid, linoleic acid, palmitic acid, stearic acid. Flavonoids ,Rutin ,Quercetin . Phenolic Compounds Rosmarinic acid ,Chlorogenic acid ,Caffeic acid . Carbohydrates Sugars ,Starch ,Mucilage , Proteins & Amino Acids ,Essential amino acids.

Common Names Of Fennel :

Sanskrit Name: Madhurika / Shatapushpa

Hindi Name: Saunf

Marathi Name: Badishep / Vari

English Name: Fennel , Sweet Fennel

Uses Of Fennel :

1. Carminative & Digestive Aid : Relieves flatulence, bloating, colic, and indigestion due to volatile oil (anethole, fenchone).
2. Expectorant in Respiratory Conditions : Used in cough, bronchitis, and sore throat as a mild expectorant and antispasmodic.
3. Galactagogue (Increases Breast Milk Production): Traditionally used to promote lactation in nursing mothers.
4. Antimicrobial & Antioxidant Activity :Shows antibacterial, antifungal, and strong antioxidant effects due to flavonoids and phenolics.
5. Relieves Menstrual Cramps (Dysmenorrhea) :Fennel oil reduces uterine spasms and pain during menstruation.
6. Mouth Freshener & Digestive Post-Meal Aid :Chewed after meals to reduce bad breath, stimulate digestion, and increase salivation.
7. Used in Infant Colic (Gripe Water): Traditionally used for infantile colic, gas, and mild digestive upset.
8. Culinary Uses :Used as a flavouring agent in foods, pickles, bakery, and confectionary; also in herbal teas.

10)GUM ACACIA : Gum Acacia, also known as Gum Arabic, is a dried gummy exudate obtained from the

stems and branches of *Acacia senegal* (L.) Willd and *Acacia seyal* Delile (Family: Fabaceae). It is widely used in pharmaceuticals, foods, and cosmetics as a natural polymer.



Fig17. Gum acacia

Macroscopic Characteristics Of Gum Acacia :-

Appearance: Occurs as tears, granules, Natural tears are rounded, ovoid, or pear-shape

Colour: Pale yellow, yellowish-brown, or almost colourless when purified.

Size : Tears vary from 0.2–3 cm in diameter.

Shape: Rounded, oval, or angular pieces. Fractures are glassy, brittle

Surface : Externally smooth or may show conchoidal fracture.

Odour : Odourless.

Taste : Tasteless or faintly sweet and mucilaginous.

Texture: Hard and brittle when dry.

Solubility : Slowly soluble in water, Insoluble in ethanol.

Impurities : May contain bark fragments or sand if crude, but official samples .

Chemical Constituents Of Gum Acacia : It mainly contains complex polysaccharides.

Glucuronic acid , D-galactose , calcium , magnesium, potassium, sodium etc .

Common Names Of Gum Acacia :

Sanskrit Name : Phalini , Yavasa Nirryasa

Hindi Name : Babul Gond , Kikar Gond

Marathi Name : Babhul Gond

English Name : Gum Acacia , Gum Arabic

Uses Of Gum Acacia :-

- 1)Pharmaceutical Uses : Demulcent (soothes mucosa)
Emulsifying agent (in emulsion preparations)
Suspending agent

Binding agent in tablet

Stabilizer in syrups

2) Medical Uses : Mild antitussive

Anti-inflammatory

Used in diarrhea (mucilage protection)

3) Food Industry : Stabilizer in beverages

Thickener in confectionery

Encapsulating agent in flavors



1. Selection Of Raw Materials :-

a) Select authentic and medicinally valuable plant parts (roots, leaves, bark, flowers, seeds, etc)

b) Avoid decomposed, diseased, or adulterated materials.

c) Identify the plant properly using pharmacognostic standards.



Fig18.Raw materials

2) Cleaning :-

a) Remove dirt, dust, foreign matter, and unwanted materials.

b) For fresh herbs wash with clean water and dry immediately.

c) For dry herbs manually clean using brushes or cloth.



Fig18.cleaning

3) DRYING : a) Dry the plant material under shade to preserve volatile and heat-sensitive constituents.

b) Temperature should not exceed 60°C for most herbal materials.

c) Use hot-air oven if needed, ensuring no loss of active components.



Fig19.Drying

4) Grinding / Pulverization :- Dried materials are pulverized using mechanical grinders or mortar and pestle. Aim for a uniform particle size depending on use (fine for internal use, coarse for external use).



Fig20.Grinding

5) Sieving :- Pass the powder through suitable mesh size sieves (e.g., sieve no. 85 or 100) to obtain uniform powder.



Fig21.Sieving

6) Mixing :- Mix the required quantity of different herbal powders homogeneously using geometrical dilution.



Fig22.Mixing

7) Packaging And Storage: a) Store in airtight containers away from light and moisture. b) Label with name, preparation date, and expiry.



Fig23.Packaging and storage

VII. CONCLUSION

This project's objective was to create and assess a herbal cough syrup. The current study has aided in our understanding of the many types of coughs and the elements that contribute to coughing. The study demonstrates that the use of herbal remedies, which have less or no side effects, is more advantageous than allopathy, which employs traditional medications for therapy. Because there are very few potential negative effects, herbal products are highly sought after.

The herbal cough powder was successfully formulated using selected medicinal plants known for their expectorant, antitussive, demulcent, anti-inflammatory, and antimicrobial properties. Each ingredient contributed a specific therapeutic action that supports relief from cough, throat irritation, and respiratory congestion. The preparation process including selection of raw materials, drying, pulverization, sieving, blending, and packaging was carried out systematically.

herbal powder can be considered a safe and effective natural remedy for cough management.

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