COMPREHENSIVE REVIEW ON FORMULATION AND EVALUATION OF AVIPATHI CHURNA

Abhimanyu raj[1], MR.Yogesh Tiwari[2], MR.Abhit kumar[2]

1. Student School of pharmacy and research Dev Bhoomi Uttarakhand University Dehradun 248007 Uttarakhand India
2. Assisatant professor school of pharmacy and research Dev Bhoomi Uttarakhand University Dehradun 248007 uttarakhand India

E-MAIL - abhimanyumehta4074@gmail.com

ABSTRACT

The standardization and normalization of herbal formulations are essential for ensuring the safe, effective, and accurate selection and processing of raw materials. This study aims to evaluate the quality of Avipathi Churna, an Ayurvedic formulation, by comparing its marketed and homemade preparations. Various quality control parameters, including phytochemical analysis, ash value, moisture content, extractive values, and fluorescence studies, were conducted to assess their compatibility and consistency.

Modern scientific methods were employed to standardize the traditional formulation, as detailed in classical Ayurvedic texts. Results indicated that the raw materials used in the formulation adhered to prescribed quality limits, confirming their purity and effectiveness. The fluorescence characteristics of the powdered formulation provided critical insights into its quality, as variations in fluorescence were attributed to the presence of diverse functional groups in the chemical constituents. Phytochemical analysis revealed the presence of glycosides, flavonoids, saponins, tannins, and proteins, which contribute to the therapeutic efficacy of the formulation. This study underscores the importance of standardization and modern scientific validation to ensure the quality, safety, and efficacy of Ayurvedic formulations.

Keywords: Avipathi Churna, quality control, standardization, Ayurvedic formulation, phytochemical analysis, herbal medicine, traditional medicine, raw material purity.

INTRODUCTION

The ancient Indian texts, Rigveda and Atharvaveda, written over 5500 years ago, highlight the medicinal properties of plants and their applications. The foundational Ayurvedic texts, Charaka Samhita and Sushruta Samhita, document a wide range of therapeutic plants. However, finding many of these medicinal plants today is challenging.

In 1978, the Indian Ministry of Health and Family Welfare established the Central Council for Research in Ayurvedic Sciences (CCRAS) under the Department of AYUSH (Ayurveda, Yoga, Naturopathy, Unani, Siddha, and Homeopathy). The goal of this organization was to promote and coordinate research in the fields of Ayurveda and Siddha medicine. Additionally, the Central Council of Indian Medicine (CCIM) was set up in 1971 to oversee and regulate Ayurvedic medical education and practice. The focal committee of Indian medication (CCIM). [1,2]

Ayurveda is recognized as one of the oldest documented medical systems in the world, with origins dating back to around 2500–500 BCE and gaining prominence as a scientific discipline around 900 BCE. The term "Ayurveda" is derived from two Sanskrit words: Ayur (life) and Veda (knowledge or science), meaning "the science of life." It is a branch of the Atharvaveda. The Charaka Samhita (circa 1900 BCE) is one of the earliest texts on Ayurveda, listing 341 plant-based remedies. The Sushruta Samhita (circa 600 BCE) emphasizes surgical procedures and describes 395 medicinal plants, 57 animal-based remedies, and 4 mineral and metal-based therapeutic agents.

One of the primary functions of the respiratory system is to clear foreign particles or excess mucus, often achieved through the reflex action of coughing. Coughing can be triggered by stimulation of receptors in the throat, airways, or lungs. While conventional medicine offers numerous treatments, traditional systems like Ayurveda, Unani, Siddha, and Homeopathy also provide natural remedies for respiratory and related ailments. Some formulations, such as Avipathi Churna, are specifically used to manage imbalances in Pitta dosha, which can lead to certain disorders.[2-10]

The Concept of Doshas

At the core of Ayurveda lies the theory of doshas—the biological energies or humors that govern the physical, mental, and emotional makeup of an individual. The three doshas—Vata, Pitta, and Kapha—are derived from the five natural elements: earth, water, fire, air, and ether (space). Each person has a unique balance of these doshas, which determines their constitution. An imbalance in the doshas disrupts the flow of prana (life force), leading to the accumulation of toxins and, eventually, disease. [11,12]

Vata Dosha

Vata is a combination of air and space elements. Individuals with a Vata constitution are typically creative, energetic, and adaptable. However, they may lack stamina and require sufficient rest. Physically, they are often lean, longlimbed, and have dry skin. Mental and emotional imbalances in Vata can result in anxiety, nervousness, and difficulty focusing, while physical imbalances may lead to constipation, gas, poor circulation, and insomnia. **[13]**

Pitta Dosha

Pitta arises from fire and water elements. People with a Pitta constitution are usually ambitious, driven, and detail-oriented, but they may also exhibit impatience and irritability. They tend to have a medium build, well-defined muscles, and a strong appetite. Pitta imbalances can result in anger, jealousy, and physical issues such as ulcers, heartburn, and skin rashes[14,15].

Kapha Dosha

Kapha is a blend of earth and water elements. Kapha-dominant individuals are calm, nurturing, and steady. They typically have a sturdy build, smooth skin, and a slow, deliberate way of learning and moving. However, excess Kapha can lead to lethargy, weight gain, and conditions such as sinus congestion, respiratory disorders, and emotional withdrawal.

Individual Constitution and Balance

Ayurveda emphasizes that health and wellness are not one-size-fits-all. Each individual has a distinct constitution, and maintaining balance within it is key to preventing illness. Early signs of imbalance serve as indicators to make adjustments to lifestyle, diet, and behavior. Addressing these imbalances through natural interventions, such as tailored herbal remedies and modified daily routines, is central to Ayurvedic healing. This personalized approach ensures that individuals achieve harmony between their physical, mental, and emotional states, promoting long-term health. [16-21]

Avipathi Churna:

Ayurvedic Digestive and Detox Remedy

Avipathi Churna is an Ayurvedic herbal blend that addresses digestive imbalances, especially those related to Pitta dosha. Known for its digestive and detoxifying properties, this finely powdered formulation helps restore balance by calming excess heat or acidity in the body.[22]

Key Benefits and Medicinal Properties:

- Antacid: Neutralizes stomach acid.
- Appetizer: Stimulates appetite and digestive enzymes.
- Digestive Stimulant: Enhances digestion and nutrient absorption.
- Carminative: Reduces bloating and gas.
- Antioxidant & Anti-inflammatory: Protects cells and reduces inflammation.
-

Uses and Conditions:

Avipathi Churna is particularly effective for Sama Pitta conditions, where Pitta is associated with toxins (Ama). It helps with:

- Gastritis & GERD: Eases inflammation and regulates acid reflux.
- Indigestion & Nausea: Relieves bloating, acidity, and nausea.
- Headaches & Migraines: Addresses digestive-linked headaches and Pitta imbalances.
- Excessive Sweating & Thirst: Regulates heat-induced perspiration and thirst.

Additional Benefits:

- Heartburn & Indigestion: Prevents acid reflux and regulates digestion.
- Gastritis: Reduces stomach lining irritation and burning sensations.
- Constipation: Offers mild laxative effects, especially for sticky, foul-smelling stools.
- Weight Loss: Supports weight management in those with aggravated Pitta symptoms. [23-31]

Conclusion:

Avipathi Churna is an effective remedy for balancing Pitta, promoting digestive health, and alleviating associated discomforts[32]

Materials and Methods Preparation of churna :

Collection and Preparation of Avipathi Churna

All ingredients were sourced from M.L. Traders, a shop specializing in Ayurvedic and Unani medicines, located in Paltan Bazar, near Kotwali, Dehradun. To ensure the quality of the ingredients, they were shade-dried, finely powdered, and passed through a No. 44 sieve. Finally, the powdered ingredients were carefully packed in an airtight container to protect them from moisture. The precise quantity of each ingredient was measured and thoroughly mixed to form a uniform blend. [33-35]

Plant Profile

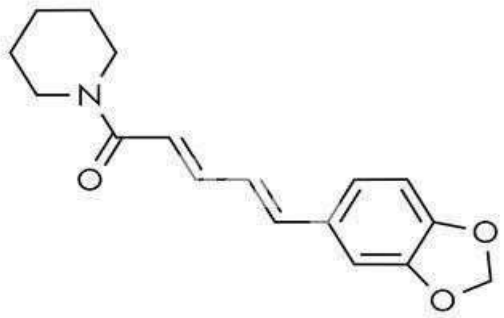
1. **Long pepper** [piper longum]

Figure .01

Therapeutic Uses:

Long pepper is widely used in traditional medicine for its digestive and respiratory benefits, as well as its ability to improve circulation and alleviate cough and indigestion

Chemical Constituents: o Longumin o Piper longumine



piperine

2. **Twak** Cinnamon (Cinnamomum) o Synonyms: Cassia Bark, Chinese Cinnamon o Family: Lauraceae o Geographical Source: China, Sri Lanka, Myanmar

figure . 02

Uses:
•Carminative
•Stimulant
•Flavoring agent

3. **Sonth** (Zingiber officinalis) o Synonyms: Zinziber, Soonth, Saunth o Family: Zingiberaceae o Geographical Source: Jamaica, South India (Cochin), Africa, Japan

Figure : 03

Chemical Constituents:

•Volatile oils (including zingiberene and sesquiterpenes)
•Gingirol (yellow, aromatic fluid)
•Shogaol and Gingirone

Uses:

•Carminative, stomachic, and aromatic
•Used in culinary dishes and beverages
•Relieves nausea and aids in digestion

4. Musta (Cyperus rotundus

. Synonyms: Nut Grass, Purple Nutsedge, Mustuk . Family: Cyperaceae

Therapeutic Uses:

o Used for treating fevers and obesity in Ayurveda o
Regulates menstruation
. Eases abdominal pain during menstruation and provides relief for depression

Figure : 04

5. Amla (Emblica officinalis)

•Family: Euphorbiaceae

• Synonyms: Indian Gooseberry, Amalaki

Uses:

•Rich in Vitamin C

•Improves digestion and enhances immunity

•Prevents hair loss

•May help in cancer prevention

Figure: 05

6. Black Pepper (Piper nigrum)

o Synonyms: Kalimirchi, Golmirchi, Milagu

o Family: Piperaceae

o Geographical Source: Native to India, also cultivated in Southeast Asia, the West Indies, and South America

Chemical Constituents:

•Alkaloids: Piperine, Piperidine

•Essential oils: Phellandrene, Caryophyllene, Piperonal

•Resins, Starch, Carotene, Thiamine, Riboflavin

Figure : 06

Uses:
•Carminative and stomachic
•Stimulates digestion
•Helps in alleviating flatulence

7.Nisoth (Operculina turpethum)

Figur: 07

•Family: Convolvulaceae
•Synonyms: Tribhandi, Trivrit, Triputa

Therapeutic Uses:
•Effective for constipation and obesity
• Aids in weight loss, purgation, and treating worm infestations.

8. Misri (Crystallizred sugar)

ff

- Uses: • Relieves breathing problems
- Soothes sore throat

- Aids digestion and alleviates cough [36-45]

EVALUATION OF PHYSICAL PARAMETERS

1. Determination of Extractive Value

The extractive value refers to the amount of extractable substances present in a crude drug. These chemical constituents can be soluble or insoluble, and their extraction depends on the specific solvent used. The extractive value is determined by macerating approximately 4-5 grams of the drug powder with a solvent for 24 hours. After this period, the solution is filtered, and the residue is discarded. The first 5 ml of the filtrate is discarded, and 10 ml is taken into a preweighed china dish and evaporated on a water bath. Once dried, the dish is cooled and weighed to calculate the extractive value.

2. Determination of Ash Value : Ash refers to the inorganic residue remaining after the controlled incineration of a crude drug. It consists of metal salts and silica. Ash content is a crucial parameter for assessing drug purity and detecting contamination, such as soil or sand.
The ash value is determined using the following methods:

a) TotalAsh

Total ash measures the overall residue obtained after complete incineration of the drug at approximately 450°C to remove all carbon. It consists of carbonates, phosphates, silicates, and silica. About 2-3 grams of the air-dried drug are incinerated, cooled, and weighed to determine the ash content.

b) Acid Insoluble Ash

This is the residue obtained after boiling the total ash with 25 ml of 2M hydrochloric acid for 5 minutes and filtering the solution. The remaining residue is washed, dried, and weighed to calculate the acid-insoluble ash.

c) Water Soluble Ash

Water-soluble ash is the portion of total ash that dissolves in water. This test indicates previous extraction or contamination of the drug with insoluble matter. d) Sulfated Ash

The drug powder is incinerated until fumes cease. Then, 10 ml of concentrated sulfuric acid is added to saturate the incinerated matter. It is further incinerated at 800°C for 15 minutes, cooled, and weighed. This process is repeated until the difference between successive weighings does not exceed 0.5 mg.

3. Determination of Moisture Content

Moisture content affects the quality and stability of crude drugs. Proper drying reduces the moisture content to 6% or less, ensuring safe storage. The moisture content can be determined by heating the sample at 100°C to 105°C or using a desiccator with phosphorus pentoxide. Loss on drying is expressed as the percentage of weight loss.

4. Determination of Physical Characteristics

- a) Bulk and Tap Density:
  Bulk density refers to the packing of particles and is calculated using the formula:
  Db = M / Vb, where M is the mass of the particles and Vb is the total packing volume.
  Tap density is determined by measuring the volume after mechanical tapping. A Shocking Volumeter is often used for this purpose.

- b) Hausner Ratio:
  The Hausner ratio indicates interparticle friction and powder flow properties. It is calculated using the formula:
  Hausner Ratio = Df / Do, where Df is tapped density and Do is bulk density.
  Values above 1.6 indicate poor flow properties.

- c) Angle of Repose:
  The angle of repose is an indirect method to assess powder flowability. It is calculated using the formula:
  $\tan \theta = H / R$, where H is the height and R is the radius of the powder cone. Angles above 50° indicate poor flow properties.

5. Phytochemical Screening

The following tests were conducted for phytochemical screening:

- a) Tests for Carbohydrates:

1. Molisch's Test: A violet ring at the junction of two liquids indicates the presence of carbohydrates.
2. Fehling’s Test: Formation of yellow or brick-red precipitate indicates reducing sugars.
3. Benedict's Test: Color change to green, yellow, or red indicates reducing sugars.

- b) Tests for Alkaloids:

1. Dragendorff's Test: Formation of orange-brown precipitate indicates alkaloids.
2. Mayer’s Test: A cream-colored precipitate indicates the presence of alkaloids.
3. Picric Acid Test: Formation of a deep yellow color confirms alkaloids.

- c) Tests for Tannins:

1. Ferric Chloride Test: A blue-black color indicates tannins.
2. Gelatin Test: Formation of a white precipitate indicates tannins.

- d) Tests for Flavonoids:

1. Shinoda Test: A pink color indicates the presence of flavonoids.

- e) Tests for Mucilage:

1. Ruthenium Red Test: Formation of a red color indicates mucilage.

- f) Tests for Glycosides:

1. Borntrager's Test: Formation of pink to red color confirms glycosides.

- g) Tests for Saponins:

1. Foam Test: Persistent foam indicates saponins.
2. Hemolytic Test: Formation of a hemolytic zone confirms saponins.

Table 1: List of Chemicals

Particulars
Ethanol
Ethyl acetate
Concentrated Hydrochloric acid
Sulphuric acid
Mayer's reagent ○ Picric acid
Fehling solution
Phloroglucinol ○ Ruthenium red
Acetic acid
Sodium hydroxide
Potassium hydroxide
Nitric acid
Ferric chloride

Table 2: List of Instruments

	.Particulars
1	Muffler Furnace
2	UV Chamber

Table 3: List of Glassware

	.Particulars
1	Petridish
2	Measuring cylinder
3	Test tube
4	Beaker
5	Glass slide

Conclusion

The credibility of traditional medicinal systems, which have persisted for centuries, will undoubtedly increase, improving their effectiveness, reputation, and acceptance if stringent quality control standards are developed and consistently enforced. The Unani formulation SufoofeMohazzil has been standardized through modern scientific quality control measures in line with traditional descriptions. The pharmacognostic characteristics established for the formulation can serve as quality control benchmarks for its evaluation and routine analysis. It can be concluded that the vast traditional herbal knowledge can be transformed into valuable assets. This transformation is achievable if the efficacy of these medicines is scientifically validated; without such validation, the system may only continue to survive based on its rich historical legacy.

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