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Pharmaceutical and Analytical Study of *Ashwagandha Paak*

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ABSTRACT

Avaleha / Paak Kalpana is *Upkalpana* of *Kwatha* which is commonly prepared nowadays and useful in various disorders. Because of simple preparation method, better palatability and longer shelf life it is gaining popularity on a large scale. *Ashwagandha Paak* has been prepared as per reference of Bharat Bhaishajya Ratnakar. After preparation it has been studied for its quality and pharmaceutical parameters.

Key words: *Paak, Avaleha, Ashwagandha, Lehya, Rasayana.*

INTRODUCTION

In *Bhaishajya Kalpana*, various *Kalpana*'s have been explained of which *Avaleha* is one of the most important *Kalpana*. *Avaleha/Paak* is a semi-solid preparation of drug. It is prepared by re-boiling of *Kwatha* or by reducing the liquid portion of *Kwatha*, *Swarasa* etc., till it attains semisolid stage.^[1] It is *Upkalpana* of *Kwatha Kalpana*. It is easy to administer, palatable and has longer shelf life. It is a semisolid preparation of herbal drugs prepared by decoction or extracts of different herbs by adding sweetening agents like jaggery, sugar or sugar candy. *Ashwagandha (Withania somnifera)* is one of the most important herbs of the Indian Ayurvedic system of medicine used as a *Rasayana*. It is also known as "Indian Winter cherry" or "Indian Ginseng".^[2]

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Rasayana is described as a herbal or metallic preparation that promotes youthful state of physical and mental health. *Ashwagandha Paak* acts as an effective nutritional remedy to overcome the health problems faced by many people. In this study, effort has been taken to prepare and analyze the quality of *Ashwagandha Paak*.

Definition^[3]

Avaleha or *Lehya* is a semi-solid preparation of drugs, prepared with addition of jaggery, sugar or sugar-candy and boiled with prescribed drug juice or decoction. They are also known as *Modaka, Guda, Khanda, Rasayana, Leha* etc.

AIMS

To describe Pharmaceutical preparation and Analysis of *Ashwagandha Paak*.

OBJECTIVES

- Collection of Raw material.
- Preparation of *Ashwagandha Paak*
- Analytical study of *Ashwagandha Paak*

MATERIALS AND METHODS

- Reference: Bharat Bhaishajya Ratnakar Part 2/153 (Yog Chintamani)
- Raw materials required to prepare *Ashwagandha Paak* are collected from reliable source.

- Preparation of *Ashwagandha Paak*.
- Analytical testing to be done in authorized laboratory.

Procedure^[4]

Table 1: Shows Ingredients of Ashwagandha Paak

Sr.No	Ingredients	Botanical Name	Part Used	Quantity in text	Quantity in gms
1	Ashwagandha	Withania somnifera	Root	10 Pal	480gms
2	Sunthi	Zingiber officinale	Rhizomes	5 Pal	240gms
3	Pippali	Piper longum	Fruit	2.5 Pal	120gms
4	Maricha	Piper nigrum	Fruit	1 Pal	48gms
5	Twak	Cinnamomum zeylanica	Bark	1 Pal	48gms
6	Ela	Elattaria cardamomum	Seeds	1 Pal	48gms
7	Teja patra	Cinnamomum tamala	Leaves	1 Pal	48gms
8	Nagkeshar	Mesua ferrea	Stigma	1 Pal	48gms
9	Mahishdugdha	Buffalo's milk	-	½ tola	2500ml
10	Madhu	Honey	-	¼ tola	1250ml
11	Goghrita	Cow's ghee	-	1/8 tola	625gms
12	Pippalimula	Piper longum	Root	½ tola	6gms
13	Jeerak	Cuminum cyminum	Fruit	½ tola	6gms
14	Guduchi	Tinospora cordifolia	Stem	½ tola	6gms
15	Lavang	Syzgium aromaticum	Flower bud	½ tola	6gms
16	Tagar	Valeriana walichi		½ tola	6gms
17	Jatiphala	Myristica fragrans	Seeds	½ tola	6gms
18	Usheer	Vetiveria zizanioides	Root	½ tola	6gms
19	Valuk	Pavonia odorata		½ tola	6gms
20	Shweta chandan	Santum album	Heartwood	½ tola	6gms
21	Bilva	Aegle mameles	Root/Leaves	½ tola	6gms
22	Kamal	Nelumbium speciosum		½ tola	6gms
23	Dhanyak	Coriandrum sativum		½ tola	6gms
24	Dhataki	Woodfordia fruticosa	Flowers	½ tola	6gms
25	Vanshlochan	Bambusa bambus		½ tola	6gms
26	Amalaki	Embelica officinalis	Fruit	½ tola	6gms
27	Khadir Saar	Acacia catechu	Saar	½ tola	6gms
28	Karpoor	Cinnamomum camphora	Camphor	½ tola	6gms
29	Punarnava	Boerhavia diffusa	Root	½ tola	6gms
30	Tulsi	Ocimum sanctum	Leaves	½ tola	6gms
31	Chitrak	Plumbago zeylanica	Root	½ tola	6gms
32	Shatavari	Asparagus racemosus	Root	½ tola	6gms
33	Sugar	-		10 Pal	480gms

- Collected all the above raw materials from the local market and weighed as per the requirement.
- Cleaned the required vessels as per the cleaning protocol approved by GMP.
- Milk was heated in stainless steel vessel on medium flame. When it started boiling, ghee and sugar were added to it.
- When the above mixture started boiling *Churna's* i.e. *Ashwagandha*, *Shunthi*, *Pippali* and *Maricha* were added. And allowed it to heat on a medium

flame, until mixture started to separate from spoon.

- It was stirred continuously during the process.
- Then *Churna's* of *Chaturjata* i.e. *Twak*, *Ela*, *Tejapatra* and *Nagkeshar* in the above mixture were added. Mild heat was given till *Pakvalakshana*.
- Once ghee started separating from the mixture, flame was turned off.
- Prakshepa Dravyas* i.e. from Sr.No 12 to 32 *Churna's* as given in Table no 1 were added after removing vessel from heat.
- After cooling of the mixture, *Madhu* (Honey) was added at room temperature.
- Prepared *Ashwagandha Paak* was packed in air-tight container and sent it to Q.C for analytical study.

OBSERVATIONS

- After mixing of *Churna's* in milk, colour of mixture becomes brown.
- As the *Paka* was continued, slowly the colour become darker and thicker in consistency.
- Typical odour of milk and ghee was being emitted during procedure.
- Continuous stirring was done to avoid charring of mixture.
- When the *Paka* of *Avaleha* reached last stage *Siddhi Lakshanas* of *Avaleha Gandha*, *Varna*, *Rasa* etc. were obtained.
- After cooling of mixture semi-solid consistency was attained.

Precautions

- All the apparatus/vessel must be clean.
- Medium flame must be maintained throughout the procedure.
- Continuous stirring is a must during procedure.
- Prakshepa Dravya's* must be added little by little at the end with continuous stirring.

- Honey should be added in the last at room temperature.

Paak Siddhi Lakshanas^[5]

- Tantumavama – Appearance of thread.
- Apsumajjati – Mixture sinks in water.
- Piditemudra – When it is pressed between two fingers then impression of fingers appear over it.
- Gandha, Varna, Rasoudhbhava – Characteristic color, odor, appearance and taste.

Anupana^[6]

Avaleha is administered along with Milk, Sugarcane juice, Panchamuli Kashaya, Vasa Kwath or other liquid substance.

Dose^[7]

- The Dose of Paak/Avaleha is One Pala.
- Dose should be decided after analyzing the Rogibala and Rogabala.

Preservation and Storage^[1]

The Lehya should be kept in glass or porcelain jars. It can also be kept in a metal container which does not react with it. Normally, Lehyas should be used within one year.

Shelf Life^[8]

According to Sharangdhara Samhita, Shelf life of Paak/Avaleha Kalpana is 1 year.

RESULTS^[9]

1. Organoleptic test

Table 2: Shows Result of Organoleptic test

Test	Result
Appearance	Semi Solid
Colour	Blackish Brown
Odour	Spicy & Pleasant
Taste	Bitter & Astringent

2. Physico-Chemical Tests

Physicochemical tests like Loss of drying, Ash value, Specific gravity, Value of acid insoluble ash, Alcohol soluble extractive value, Water soluble extractive and pH value.

a) Loss on Drying

Aim: This was conducted to find out the moisture content in the sample.

Principle: The amount of moisture and other substance that get volatilized in the sample, which is specific to drug or formulation and in controlled heating of sample for specific duration removes the components and a constant weight is obtained. The loss is observed in the initial weight and is expressed as LOD percentage w/w.

Procedure: 5 gm sample was taken in a previously dried and weighed evaporating dish and dried initially on a water bath and finally in an oven at 105°C temperature till constant weight is obtained. From the weights noted, the loss on drying of the sample was calculated and expressed as percentage w/w.

b) Total Ash

Aim: This test was done to assess the total Ash value of sample.

Procedure: 3 gm of accurately weighted sample taken in crucible and was incinerate at a temperature not exceeding 4500 until free from carbon. Allow cooling and weighted. Carbon free ash could not obtained in this way therefore charred mass exhausted with hot water and residue was collected on an ash less filter paper. Residue and filter paper were incinerated filtrate was added evaporated to dryness and ignited at a temperature not exceeding 4500. Value of total ash was calculated with reference to air-dried drug.

c) Acid insoluble ash

Aim: This test was done to assess the acid insoluble ash value of sample.

Procedure: Dilute hydrochloric acid was added in crucible which contains ash. Solution was filtered and insoluble matter was collected on an ash less filter

paper (whatman41). It was washed with hot water until the filtrate gets neutral. Filter paper containing the insoluble matter transferred to the original crucible. It is dried on hot plate and ignited to constant weight. It was allowed to cool in desiccators for 30 minutes and weighted without delay. Value of acid insoluble ash was calculated with Reference to air-dried drug.

d) Water soluble extractive

Aim: Estimation of Water soluble extractive value of sample.

Procedure: 5 gm *Avaleha* sample was taken in a clean conical flask; 100 ml water was added to it and shaken repeatedly till it mixed properly. Flasks were closed and kept overnight. Next day they were filtered and 20 ml filtrate was taken in an evaporating dish, which was clean, dry and previously weighed. Then the samples were evaporated on water bath, dried in oven at 110 °C till constant weight, cooled and weighed. From the weight of the residue obtained the percentage of water soluble extractive was calculated.

e) Alcohol Soluble Extractive

Aim: Estimation of alcohol soluble extractive value of sample.

Procedure: Methanol soluble extractive of the samples of was determined in the similar way like water soluble extractive but using methanol as solvent instead of water.

f) pH

Principle: The pH value of an aqueous liquid may be defined as the common logarithm of the reciprocal of the hydrogen ion concentration expressed in g per liter.

Aim: Although this definition provides a useful practical means for the quantitative indication of the acidity or alkalinity of a solution.

Table 3: Shows Result of Physico-Chemical test

Test	Results
Loss of Drying	4.0%

Ash	2.08%
AIA	0.26%
Specific Gravity	2.90%
pH	5.8
Alcohol soluble extract	50.10%
Water soluble extract	70.25%
Microbial & Fungal contamination	Free from Fungal and Bacterial infestation

DISCUSSION

In this study *Ashwagandha Paak* is prepared as per Bharat Bhaishajya Ratnakar Part 2/153 (Yog chintamani) with due precautions. Further Analytical Study was carried out to analyze the final product with the standard parameters. Analytical study is an essential measurement for ensuring the quality control of the final product. Quality control parameters are necessary to establish safety, efficacy of the product. The parameters used for analysis are organoleptic characters and physico- chemical parameters. Any change in raw material and method of preparation can cause variation in these parameters.

- Organoleptic parameter: These are basic test for final product. It includes colour, consistency, taste and smell.
- Physico-chemical parameters: It includes pH, Loss on drying, Specific gravity, Ash value, Acid insoluble ash value, Alcohol soluble extractive, Water soluble extractive.
- Loss on Drying: It indicates the moisture content. Higher moisture content may enhance the rate of rancidity.
- Total Ash: It is important to illustrate the quality as well as purity of formulation. It helps in determining both physiological ash (plant tissue) and non-physiological ash (extraneous matter like sand and soil).

- Acid Insoluble Ash: It is important to illustrate the quality as well as purity of formulation.
- Water Soluble Extractive Value: It indicates the amount of active constituent extracted in aqueous solution expressed as percentage of extractive value. Less extractive value indicates the addition of exhausted material, adulteration or incorrect processing during drying, storage or formulating.
- Alcohol Soluble Extractive Value: It indicates the amount of active constituent extracted in methanol expressed as percentage of extractive value. Less extractive value indicates the addition of exhausted material, adulteration or incorrect processing during drying, storage or formulating.
- pH value: pH value indicates acidity or alkalinity. It is the negative logarithm of hydrogen ions in the solution.

CONCLUSION

Analytical study of *Ashwagandha Paak* was carried out on the basis of classically illustrated organoleptic tests and modern parameters. Loss on Drying is 4.0%. Lower the moisture content greater the shelf life. Ash value is 2.08%. Lesser the Ash value betters the quality of ingredients and its product. Value of acid insoluble ash is 0.26%. Specific gravity of *Ashwagandha Paak* is 2.90%. Alcohol (Methanol) soluble extractive is 50.10%. Water soluble extractive value ranged in between 70.25%. pH is 5.8 which means its acidic in nature. Drugs get easily absorbable in acidic media. There is no microbial or fungal growth seen on final product. From above Parameter it is found that *Ashwagandha Paak* has good quality and efficacy. This form of dosage gives long shelf life and better palatability.

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