



## Phytopharmacognostical investigation of sitopaladi churna

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### Abstract

Churna is an ayurvedic dosage form that contain an herbal powder which is complex mixture of different ingredients each ingredient has a variable activity concentration of phyto chemical, consistency, stability and shelf life as per particle size Sitopaladi churna is one of widely using compound formulation indicated in respiratory disorders for all ages to observe the effect of stability in sitopaladi churna study was conducted it is formulated by mixing powder of sharkara (sugar), vamsa (bamboo), Pippali (long pepper), tavak (cinnamon), suksmalia (cardamom) with the help of reported composition and standard procedure formulated sitopaladi churna compared with the marketed formulation here sitopaladi churna was prepared by using 80# mesh size and done physicochemical, phytochemical, organoleptic features, microscopical characters...etc. it is based on sitopaladi churna restoration of natural function of respiratory digestive immune and several other system of body it is prescribed for the treatment of cold, cough, pneumonia, intercostal neuralgia, pharyngeal and chest congestion

**Keywords:** sitopaladi churna, traditional medicines, phisico chemical, phyto chemical, ayurvedic churna, TLC standardization

### Introduction

India has a rich heritage of traditional medicine constituting with its different components like Ayurveda, Siddha and Unani. Traditional health care has been flourishing in this country for many centuries. Ayurveda and other Indian systems of medicines may be explored with the modern scientific approaches for better leads in the health care [1]. In the last few decades, there has been an exponential growth in the field of ayurvedic medicine. There are great need of standardization and quality control of ayurvedic formulations Standardization and quality control depends upon the nature of crude drug and compound drugs, its source i.e. factors associated with raw materials which are beyond of human control like seasonal, geographical, age. of the plant, time of collection, type of drying etc. due to these natural conditions. The percentage of chemical constituents of the drug does no remain uniform as our expectation [2].

The need of quality control for ayurvedic drug is due to the fact that the preparation of drug according to the ancient method has been reduced due to the commercialization of ayurvedic pharmacy The absence of post-market surveillance and the paucity of test laboratory facilities also make the quality control of ayurvedic medicines exceedingly difficult at this time. Therefore, an attempt has been made to standardize sitopaladi Churna, an Ayurvedic formulation as prescribed in Ayurvedic Formulary, used as anti tussive, common cold etc.. The individual plant powders of the formulation were subjected to various pharmacognostical parameters. Three formulation, one in-house preparation and two samples from different manufactures were procured and subjected to various physicochemical analysis, TLC [3]

Ayurveda the traditional indian medicine is the great tradition with sound of philosophical experiential and experimental basis churna is one of the important solid dosage form churnas are preparation comprising a fine powder of drugs and may be simple or compound the principle of using churnas Is due to the fact that therapeutic

value of most of the substance greatly increase when they are reduce to very fine state of subdivision churna is fine powder of drug and drugs are intended for oral administration to overcome the disease many ayurvedic formulations are used like asava, arishta, arka, avleha, kavatha, churna, lepa, vatika, gutika, netrbindu, sattva, gritta, bhasma...etc [4]

The world health organisation (WHO), in 1999 has given a detail a protocol for standardization of herbal drug but very little literature is available for the standardization of polyherbal drugs by considering the increasing demand for ayurvedic formulation Is more important to assure the quality, purity, safety, efficacy ayurvedic powders are prepared by without any excipients that may affect the stability shelf life of churna as per official gazette is two years,i.e when stored in air tight container with proper precautions but it's difficult to access the state of churna when handled by consumers at difficult climate conditions. The powders exposed to different environmental factors may caused degradation of phytoconstituents and also may have microbial growth affecting the therapeutic value of churna [5].

Sitopaladi churna is one of the most commonly practiced formulation mainly indicated in respiratory disorders in all ages. cold, cough, pneumonia, intercostal neuralgia, pharyngeal and chest congestion it consist of a mixture of powdered of sitopala sharkara(sugar), vamsa(bamboo), Pipali (long pepper), tavak (cinnamon), suksmalia (cardamom) [6]. It is recipe of traditional ayurvedic pharmacopeia well known as effective relieving coughs associated with respiratory disorder dispensing and consumption of churnas(powder) is inconvenient to the patient churna are stick to the tongue and oral cavity due to in herent adhesive nature churnas are astringent, bitter and pungent taste churnas being in powdered form also suffer stability due to there hygroscopicity a dosage form can affect the stability environmental factor such as temperature light air humidity can affect the stability [7]

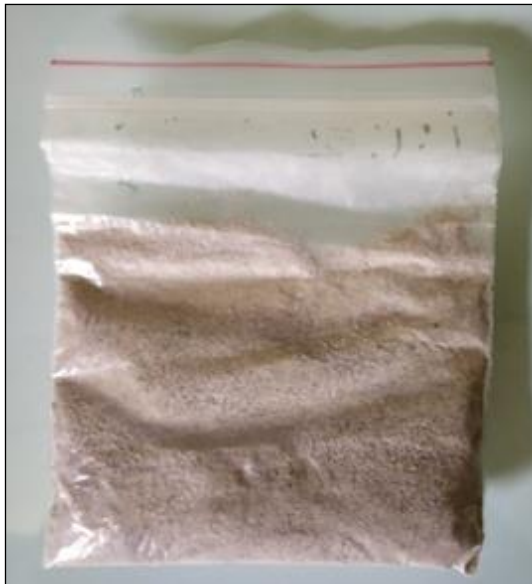


Fig 1: sitopaladi churna (lab)



Fig 2: sitopaladi churna(baidyanath)

Table 1: Composition of sitopaladi churna

Sr. no.	Name of drug	Latin name	part	Quantity
1	Sharkara	Sugar candy	-	5.162gm
2	Vamasa	Bamboosa arundicia wild	Nirayas	2.581gm
3	Pipali	Piper longam	Fruits	1.290gm
4	Tvak	Cinnamenum zeylanicum	Bark	0.322gm
5	Suksamalia	Elettaria cardamomum	seed	0.645gm

Uses

1. Sharkara

In Ayurveda sharkara refers to “crystal sugar”,sharkara is the most highly regarded of all type of sugar it is made from sugar cane and during production impurities are separated out through a slow process of recrystallization finally the

crystals are reduce in small pieces and are ground very fine it is used in ayurvedic formulation known as cyavanaprasana ayurvedic health product that helps in immunity boosting it is very mild and according to Ayurveda has a hormonising effect the acid producing part of sugarcane are mainly found in the joint and roots of the plant



Fig 3

Uses

Used in treatment of piles, anorexia, indigestion, cough, cold, asthma, bronchitis, throat pain, infection.

Use in effect of tridosha:-vatta, kapha, pitta  
Sweetener preservatives texture modifier fermentation substract, colouring and flavouring agent, bulking agent

2. Vamasa

The dried resin called as vamshalochana Vamasa (bamboosa arundinacea) is a plant mentioned in ayurveda for the treatment of cough,skin diseases, wound, digestive disorder,nausea gynaecological disorder and fever it is an ayurvedic herbal dry powder of bamboo manna vamasa lochana is collected from inside hollow internodes of bamboo whole parts of bamboo are used it is silica like secretion from internodes of bamboo plant vamasalochana means bamboo eyes which is eye like crack in the bamboo vamasa is an adptogen, antacid, aphrodisiac, bronco dilator and expectorant it is possibly safe and well tolerated by most people when taken in recommended it is the best cough expectorant for infected cough with green sputum it is believed to enter rasadhātu and helps to clear fever



Fig 4

**Uses**

Expectorant, diuretic, cardio tonic, cardio protective  
 It helps in good blood flow homeostatic,  
 the root of bamboo is made into paste and applied over the  
 area affected with eczema dark discoloration  
 it is helps to reduce accumulation of gas in the stomach  
 To cure fever linked with flu chest congestion, loss of  
 appetite <sup>[8-9]</sup>

**3. Pippali**

pippali is an essential herb used in various ayurvedic medicines it is also called piper longum, long pepper, pipali, pimpli it is plant based the roots and fruits of pippali are used for medicinal purpose it is effective in home remedy in managing cough and cold it is used as rasayana it is close relative to black pepper it is pungent in taste and light in its effect it is important drug in Ayurveda it is an effective herb in managing cough and it controls the cough pippali has decongestant bronchodilator and expectorant long pepper is a spice that has a sharp hot and sweet taste it is used to crushed it comes from berries that grow clumped together in a spike on a shrub the plant is a perennial but in January it died black down to the ground

**Fig 5****Uses**

Useful in cold, cough, asthma, bolating, anorexia,  
 Bronchodilator, expectorant,  
 Clears air passages it is anti-inflammatory, analgesic  
 antioxidant, antimicrobial, purifies the blood, boosts  
 digestion, decreases fever, coughs, hiccups <sup>[10]</sup>

**4. TVAK**

The plant tvak also known as cinnamon (dalchini) it is used on ayurvedic herbal powder mixes its botanical name is cinnamimum zey lanicum blume tavak is a dried inner bark (devoid of cork cortex) of choppiest shoots of steam used in various ailments like flu, indigestion, edama and cough in Ayurveda its taste is pungent, sweet and hot in nature it is light rough penetrating cinnamon is excellent at revving up the digestion because of its warming property its pacifying for kapha and balancing vata it is bushi green tree of the laurel family (lauraceae) and the spice derived from its bark

**Fig 6****Uses**

Chewing of tvak helps to recover nausea tvak helps to relieving vomiting due to its mild astringency it also works beneficial for the people suffering from piles the spice is known to have the ability to stop medication resistant yeast infection tvak is anticolic, aromatic, analgesic and anti-emetic in process it is said to strengthen heart muscles and disease of urinary bladder as it is anti-microbial it can help build immunity against day to day infection <sup>[11]</sup>

**5. Suksmalia**

Suksmalia consists seeds of dried fruits of elettaria cardamomum (Linn) maton and its varieties (fam.Zingiberacem) a stout large perennial herb growing naturally on moist forest of western ghats up to 1500m, also cultivated in many other parts of south india at an elevation from 750-1500m suksmalia has been used for traditional medicine application including for the control of asthma, teeth and gum infection, cataracts, nausea, diarrhea, as well cardiac, digestive and kidney disorders exccive consumption of cardamom can lead to diarrhea and dehydration



Fig 7

### Uses

Aruci

It is mouth freshener

Deodorant

Antidiseptic

Used in oral disorder

Expectorant

Used in cough

Asthma, useful in burning sensation [12]

### Material and Method

#### 5. material

Raw material

sitopala sharkara (sugar), vamasas (bamboo), Pipali (long pepper), tavak (cinnamon), suksmalia (cardamomum)

#### 6. method

All herbal ingredients of sitopaladi churna were purchased from local market

Preparation of churna

The formulation of churna was done as per ayurvedic formulary of India and each ingredient is shown in fig

**Table 3:** Composition of sitopaladi churna

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1	Sharkara	Sugar candy	-	5.162gm
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5	Suksmalia	Elettaria cardamomum	seed	0.645gm

### Preparation

Sitopaladi churna was prepared as per ayurvedic formulary of India. Take all ingredients like sharkara (sugar cane), Vamasolochana (vamasas), pipali (piper longum), tvak (cinnamomum), suksmalia (Elettaria cardamomum), make a powder of separately ingredient and pass through the sieve no 80 and then weigh a separately each powdered ingredient and mix them then make a homogenous blend packed it in tightly closed container to protect from moisture and light [13]

### Organoleptic Evaluation

**Table 2:** Organoleptic properties of sitopaladi churna

Sr No	Physical Properties	Observation
1	appearance	powder
2	color	whitish brown
3	taste	sweet
4	odor	fragrant

### Physicochemical evaluation

#### Determination of ASH value

About 1gm accurately weighed sitopaladi churna was taken in tared silica dish and incinerated at a temperature not more than 450°C until free from carbon then cooled and weighed [14]

Formula=

$$\text{Total ash value \%} = [z-x/y] * 100$$

#### Determination of Acid Insoluble Ash

To the crucible containing total ash, 25 ml of dilute hydrochloric acid is added. The insoluble matter on an ash less filter paper is collected and washed with hot water until the filtrate is neutral. Filter paper containing the insoluble matter is transferred to the original crucible, dried on a hot-plate and ignited to get constant weight in an incinerator. Allowed the residue to cool for 30 min [14]

Formula

$$\text{Acid insoluble ash} = [a/y] * 100$$

#### Determination of Water Soluble Ash

Total ash is boiled for 5 minutes with 25 ml of water; insoluble matter is taken on an ash less filter paper, washed with hot water, and ignited for 15 minutes at a temperature not exceeding 450 °C. The weight of the insoluble matter is subtracted from the weight of the ash; the difference in weight represents the water soluble ash. [14]

FORMULA

$$\text{WATER SOLUBLE ASH} = [a-b/y] * 100$$

#### Determination of Moisture Content By Lod

Each ingredient (1 gm.) was taken in petridish individually and noted the weight (W1). Ingredients were dried in a hot air oven at 100 °C for 3 hours. Final weight (W2) was noted and the loss in weight is considered as moisture content. [14]

Formula

$$\text{MOISTURE CONTENT BY LOD} = [W1-W2/W1] * 100$$

#### Determination of PH

The pH of different formulations in 1% w/V and 10% w/V of water soluble portions was determined using standard glass electrode at 24°C according to the prescribed standard method in Indian Pharmacopoeia [15]

#### Determination of Tapped Density

Each ingredient (10 gm.) was taken in a measuring cylinder and the volume before and after tapping 100 times was noted. [16]

Tapped bulk density was calculated based on the following

Formula

$$\text{Tapped bulk density} = \text{weight of the ingredient} / \text{Tapped volume}$$

**Determination of bulk density**

It is the ratio of weight of powder to bulk volume. The bulk density depends on particle size distribution, shape and cohesiveness of particles.

Accurately weighed quantity of powder was carefully poured into graduated measuring cylinder through large funnel and volume was measured which is called initial bulk volume. Bulk density is expressed in gm./cc and is given by, The weight per volume of a powder it is the mass of many particles of the material divided by total volume includes they occupy [16]

Formula

$$\text{Bulk density} = \text{weight of powder} / \text{volume of powder}$$

**Determination of angle of repose**

Take 10 gm. of each ingredient was taken and passed through the funnel to obtain a pile of the powder.

The height (h) and radius (r) of the pile of the powder were noted down. The angle of repose ( $\theta$ ) was calculated using the [16]

Formula

$$\text{Angle of repose } (\theta) = \tan^{-1} (h/r)$$

**Determination of Hausner's Ratio**

It is related to interparticle friction and as such can be used to predict the powder flow properties. Powders with low interparticle friction such as coarse spheres have a ratio of approximately 1.2, whereas more cohesive, less flow able powders such as flakes have a Hausner ratio greater than 1.6. [16]

Formula

$$\text{Hausner's ratio} = [\text{tapped density} / \text{bulk density}]$$

**Phytoconstituents evaluation****Test for Alkaloids**

Take a 5ml of powdered solution was added into 2ml HCL to this acidic medium 1ml dragendorff's reagent was added and an orange and red precipitate produced immediately that indicates the presence of alkaloids [17]

**Test for Glycosides**

Take a 5ml of powdered solution was treated with 2ml of glacial acetic acid containing one drop of ferric chloride solution with 1ml of conc sulphuric acid a violet ring may appear that indicates presence of glycosides [17]

**Test for Flavanoids**

TAKE 5 ML dil ammonia solution were added to a portion of the aqueous filtrate of powdered solution by addition of conc sulphuric acid a yellow coloured observed that indicates the presence of flavanoids [17]

**Test for Tannins**

Take 0.5 g of sample was boiled in 20ml of water in a test tube and then filtered a few drop of 0.1% ferric chloride was added and observed for brownish green or blue colour that indicates presence of tannins [17]

**Test for Saponins**

About 2gm powdered sample was boiled in 20 ml distilled water in a water bath and filtered 10ml of the filtrate was

mixed with 5ml distilled water and shaken vigorously for stable froth [17]

**Test for Fats**

0.5 ml powdered solution mixed with 5ml of ether these solution was allow to for evaporation on filter paper and dried filter paper the appearance transparency on filter paper that indicates presence of fats [17]

**Test for Carbohydrate**

Aqueous solution of substance +10% alcoholic solution of a naphtholshake+ conc sulphuric acid along the side of t.t a violet ring at the junction of two liquids that indicates all carbohydrates present

**Determination of TLC and UV Detection**

Powder of 10g of churna sample with 40 ml ethanol under reflux on a water bath 30 min filter and conc the extract to 10 ml and carry out the TLC take 10ul of the sample on silica gel plate take TLC plate and developed the plate to a distance 1cm using toluene ethyl acetate (1:3) as mobile phase then dry the plate in hot air oven at 105\*c and then examine the spot [18]

UV = ^MAX 254NM



Fig 8: TLC of sitopaladi churna

## Result

### Microscopy of standard sitopaladi churna



Fig 9

### Microscopy of test sitopaladi churna



Fig 10

**Table 4:** Organoleptic characters of standard and test of sitopaladi churna

Sr no	Parameter	Formulation Standard	Test
1	state	fine	Very fine
2	Colour	Whitish brown	Whitish brown
3	odour	fragrant	Fragrant
4	Taste	Aromatic and sweet	Aromatic and sweet

**Table 5:** Physicochemical Evaluation of Standard and Test Sitopaladi Churna

Sr no	Parameter	Standard sitopaladi churna	Test sitopaladi churna
1	Total ash	4.0	4.2
2	Acid insoluble ash	4.1	3.9
3	Water soluble Ash	2.2	2.4
4	LOD	1.2	2.1
5	PH [10%w/v]	7.2	7.4

**Table 6:** Physical Characteristics of Standard and Test Sitopaladi Churna

Sr no	parameter	Standard sitopaladi churna	Test sitopaladi churna
1	Tapped density	0.50	0.54
2	Bulk density	0.4	0.5
3	Angle of repose	33.3	35.7
4	Hausner's ratio	1.16	1.18

**Table 7:** Phytoconstituent evaluation of standard and test sitopaladi churna

Sr no	Parameter	Standard sitopaladi churna	Test sitopaladi churna
1	Alkaloids	present	Present
2	Glycosides	Present	present
3	Flavonoids	present	Present
4	Tannins	Present	present
5	Saponins	Present	Present
6	Fats	present	Present
7	Carbohydrates	present	Present

### Conclusion

Sitopaladi churna is an ayurvedic formulation. In the study, the 2 different polyherbal sitopaladi formulations were taken and then evaluated as per Indian Pharmacopoeia. There are so many different properties like organoleptic, ash value, extractive value, physical characteristics (tapped density, bulk density, Hausner's ratio, angle of repose), phytochemical evaluation, TLC AND UV detection. After analysis of the sample of sitopaladi churna by different parameters, it showed reproducible results.

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