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Study of *Sitopaladi Churna* with reference to its Physico-Chemical, Phytochemical & Microbial Analysis

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ABSTRACT

Churna is an Ayurvedic dosage form that contains an herbal powder which is a complex mixture of different ingredients. Each ingredient has a variable activity, concentration of phytochemicals, 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* a study was conducted. Here *sitopaladi churna* was prepared by using 80# mesh size and done *Physico chemical, Phytochemical & Microbial Analysis*

KEYWORDS

Sitopaladi Churna, Physico chemical, Phytochemical & Microbial Analysis



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INTRODUCTION

Churna kalpana (herbal powder) is one of the important solid dosages of bhaishajya kalpana¹. Churnas are preparations comprising of fine powders of drugs and may be simple or compound⁴. The principle of using churnas is due to the fact that therapeutic value of most of the substances greatly increases when they are reduced to very fine state of subdivision. Herbal powders are complex mixtures of different component each component has variable activity, concentration and consistency, stability condition and shelf life².

Ayurvedic powders are prepared without any excipients that may affect the stability³. Shelf life of churna as per the official gazette is 2 year, i.e., when stored in air tight container with proper precautions⁶. But it's difficult to assess the state of churna when handled by consumers at different climatic conditions. The powders exposed to different environmental factors may cause

degradation of phyto constituents and also may have microbial growth, affecting the therapeutic value of churna.

Sitopaladi churna is one of the most commonly practiced formulations mainly indicated in respiratory disorders in all ages. So in the present study Sitopaladi churna was selected for its microbial growth analysis⁵.

OBJECTIVE

Study of Sitopaladi Churna for its physico-chemical, phytochemical & microbial analysis.

MATERIALS & METHODS

All the ingredients were procured from GMP certified KLE Ayurvedic Pharmacy. Preparation of Sitopaladi churna was conducted in Department of Rasashastra & Bhaishajya kalpana, KLEU Shri B.M.Kankanwadi Ayurveda Mahavidyalaya.

Table 1 Ingredient of Sitopaladi Churna and their Quantity⁷

Sr.no.	Name of drug	Latin name	part	Quantity
1	Khandasharkara	Sugar candy		1280gm
2	Vamshalochana	<i>Bambusa arundicia Wild.</i>	Nirayas	640gm
3	Pippali	<i>Piper longam Linn.</i>	Fruits	320gm
4	Ela	<i>Elettaria cardamomum Maton.</i>	Seeds	160gm
5	Twak	<i>Cinnamenum zeylanicum Breyne</i>	Bark	80gm

Methodology: All ingredients were taken as per specified quantity in a stony mortar and triturated till powder forms. Powder was filtered through 80 number meshes and stored separately⁸. All individual powders were taken as per specified quantity in a porcelain mortar



and triturated till homogenous powder forms. Prepared Sitopaladi Churna will be packed in plastic containers and used for analysis.

Results:

The Results are obtained mainly under two headings:

- Pharmaceutical results
- Analytical results

PHARMACEUTICAL RESULTS

Table 2 Weight Observation of Raw Drugs And Their Fine Powder

Ingredient	Form	Weight	Weight Loss
Sita/Khandasharakara	Raw	1290gm	10gm
	Fine powder	1280gm	
Vamsalochana	Raw	700gm	60gm
	Fine powder	640gm	
Pippali	Raw	500gm	180gm
	Fine powder	320gm	
Ela	Raw	500gm	340gm
	Fine Powder	160gm	
Twak	Raw	180gm	100gm
	Fine powder	80gm	

Table 3 Organoleptic Characters of Sitopaladi Churna

Sitopaladi churna	Form	Fine powder
	Color	Greyish
	Odour	Characterstics
	Taste	Astringent

ANALYTICAL RESULTS

Analysis of Raw Materials

Table 4 Physico-Chemical Analysis of Raw Drugs and their API Standards⁹

Name of the drug	Total ash	Acid insoluble ash	Alcohol soluble extract	Water soluble Extract	Loss on drying
Sita/ Khandasharkara	16%	10%	-	-	0.54
Vamshalochana	85%	62%	-	-	0.06
Pippali (API)	6.21% NMT7%	0.42% NMT0.5%	6.83% NLT 5%	11.2% NLT 7%	0.12
Ela (API)	5.31% NMT6%	1.41% NMT 2%	6.46% NLT 4%	11.2% NLT10%	0.26
Twak (API)	2.14% NMT3%	1.63% NMT 2%	2.49% NLT 2%	3.28% NLT3%	0.58

* Note:-NMT- Not more than, NLT- Not less than

**Table 5** Organic Compounds of Raw Drugs

Tests for	Pippali		Ela		Twak	
	W.E	A.E	W.E	A.E	W.E	A.E
Carbohydrates	N	N	P	P	N	N
Reducing sugar	P	P	P	P	P	P
Monosaccharides	N	N	N	N	P	P
Pentose sugar	P	P	N	N	P	P
Hexose sugar	P	P	N	N	N	N
Proteins	P	P	N	N	P	P
Amino acids	N	N	P	P	P	P
Starch (Non reducing polysaccharides)	P	P	N	N	N	N
Steroid	P	P	N	N	P	P
Cardiac glycosides	N	N	P	P	N	N
Saponin glycosides	N	N	P	P	P	P
Flavonoids	P	P	P	P	N	N
Alkaloids	P	P	P	P	P	P
Tannins and phenolic compounds	N	N	N	N	P	P

W.E- Water Extract; A.E- Alcohol Extract
(P) –Present & (N) - Negative

Table 6 Qualitative Test for Inorganic Elements of Raw Drugs

Tests for	Pippali	Ela	Twak
Calcium	A	P	P
Magnesium	P	P	P
Sodium	P	P	P
Potassium	P	P	P
Iron	A	A	A
Chloride	P	P	P
Nitrate	P	P	P
Sulphate	A	P	A
Carbonate	A	A	P
Phosphate	A	A	P

(P) Present (A) Absent

Table 7 TLC of Individual Drugs of Sitopaladi Churna

Sr no	Name of the drug	Normal light	Short wave	Long wave
1	Pippali	0.37,0.45,0.53	0.37,0.45,0.53	No band
2	Ela	0.16,0.26,0.40	0.16,0.26,0.38	No band
3	Twak	0.91,0.96,0.98	0.91,0.95,0.97	0.90

Table 8 Microbial load test of Raw Drugs¹⁰

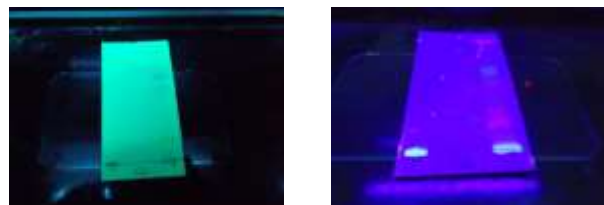
Sr .no	Drug Name	Total Bacterial count	Total Fungal count
1.	Sita/Khandasharkara	Under Limit	Under Limit
2.	Vamsalochana	Under Limit	Under Limit



3.	Pippali	Under Limit	Under Limit
4.	Ela	Under Limit	Under Limit
5.	Twak	Under Limit	Under Limit

TABLE 9 Microbial Limit Test of Raw Drugs

Sr.no	Drug Name	Result
1.	Sita/khandasharkara	Under Limit
2.	Vamsalochana	Under Limit
3.	Pippali	Under Limit
4.	Ela	Under Limit
5.	Twak	Under Limit

Figure 1 TLC of Individual Drugs of Sitopaladi Churna**Table 12** Microbial Limit Test of Sitopaladi Churna

Sr.No.	Micro-organisms	Results in Sitopaladi churna
1.	<i>S.aureus</i>	Absent
2.	<i>P.auriginosa</i>	Absent
3.	<i>E.coli</i>	Absent
4.	<i>S.abony</i>	Absent

Table 13 Results of Microbial Load Test of Sitopaladi Churna¹¹

Sr.no	Drug Name	Total Bacterial count	Total Fungal count
1.	Sitopalad i churna	Under Limit	Under Limit

DISCUSSION

The present study highlights development of a polyherbal formulation from churna dosage form into pharmaceutical suspension. The formulation selected here is Sitopaladi churna which is explained in treating the ailments Kasa(Cough), Swasa(breathing), and respiratory disorders etc.

Raw materials

All the raw drugs analysis was done in central research facility.

Microbial study of raw drugs:

Total microbial load:

a. Value shown under limit of all individual drugs as per the Indian Pharmacopeia.

Microbial limit test:

a. Value shown under limit of all individual drugs as per the Indian Pharmacopeia.

1. Pharmaceutical Part

Drug manufacturing is a unique process which varies according to different dosage forms. The main aim of pharmaceutical study is to convert the raw drugs into suitable dosage form. In this context pharmaceutical study deals with preparation



of churna from individual raw drugs, homogenously mixing them to form Sitopaladi churna.

Raw materials

1. Organoleptic character: all drugs showed its own characteristics.

2. Total ash, acid insoluble ash, water soluble and alcohol soluble extract of Khandasharkara was 16%, 10% and loss on drying was 0.54%.

3. Total ash, acid insoluble ash, water soluble and alcohol soluble extract of Vamsalochana was 85%, 62% & loss on drying was 0.06% and pH was 7.04.

4. Total ash, acid insoluble ash, water soluble and alcohol extract of Pippali was 6.21%, 0.42%, 6.83%, 11.2% and loss on drying was 0.12% and pH was 6.75.

5. Total ash, acid insoluble ash, water soluble and alcohol extract of Ela was 3.31%, 1.41%, 6.46%, 11.2% and loss on drying was 0.26 and pH was 6.45.

6. Total ash, acid insoluble ash, water soluble and alcohol extract of Twak was 2.14%, 1.63%, 2.49%, 3.28% and loss on drying was 0.58 and pH was 5.79.

7. Preliminary physico-chemical analysis and phyto chemical analysis of Raw drugs:

- a. Carbohydrate present in Ela
- b. Reducing sugar presence in all ingredients

- c. Monosaccharide presence in only twak
- d. Pentose sugar present in pippali and twak
- e. Hexose sugar presence in pippali
- f. Proteins presences in pippali and twak.
- g. Amino acid presence in Ela and twak
- h. Starch presence in pippali
- i. Steroids presence in pippali and twak
- j. Cardiac glycoside is absence in all ingredients

k. Saponin glycoside presence in Ela and twak

l. Flavonoids presents only Ela

m. Alkaloids presents in all ingredients

n. Tannin and phenolic compound present in Ela and twak.

o. Calcium, magnesium and potassium present in all ingredient.

8. TLC of raw drugs:

1. Pippali: Normal Light: 0.37, 0.45, 0.53
Short Wave: 0.37, 0.45, 0.53

2. Ela: Normal Light: 0.16, 0.26, 0.40
Short Wave: 0.16, 0.25, 0.38

3. Twak Normal Light: 0.91, 0.96, 0.98

Short Wave: 0.91, 0.95, 0.97

Long Wave: 0.90

Microbial study:

a. Total microbial load:

In the sample value showed under limit. [I.P].

b. Microbial limit test:



Results shown under limit as per the Indian pharmacopeia

CONCLUSION

Minimal variations seen in the physico chemical and phytochemical & microbial load of the sample and result of microbial limit was under limit as per the Indian pharmacopeia.



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