



Research Article

PHARMACOGNOSTICAL AND PHARMACEUTICAL ANALYSIS OF *YAVANISHADAVADI VATI* - AN AYURVEDIC POLYHERBAL FORMULATION

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ABSTRACT

Pulmonary Tuberculosis (PTB) is caused by the aerobic acid-fast rod-shaped bacterium *Mycobacterium tuberculosis*. This tiny bacterium, expelled from a contagious host, can remain suspended in air as droplet nuclei for hours. Multidrug-resistant tuberculosis (MDR-TB) is a form of TB caused by bacteria that do not respond to isoniazid and rifampicin, the 2 most effective first-line TB drugs. In Ayurveda, the term *Rajyakshma* has been used interchangeably with tuberculosis. *Rajyakshma* is primarily attributable to *Dhatukshaya* (tissue emaciation or loss). **Aim:** To analyze the Pharmacognostical and Pharmaceutical properties of *Yavanishadavadi Vati*. **Materials and Methods:** *Yavanishadavadi Vati* was subjected to microscopic evaluation for pharmacognostical study, physico-chemical analysis like hardness, weight variation, loss on drying, ash value, acid insoluble extract, pH value, water soluble extract, alcohol soluble extract and high performance thin layer chromatography (HPTLC). **Result:** Pharmacognostical study showed the presence of certain identifying characteristics of all the ingredients of *Yavanishadavadi Vati* that is *Yavani*, *Tintidaka*, *Shunthi*, *Amalvetasa*, *Dadima*, *Badara*, *Dhanyaka*, *Suvarchal Lavana*, *Jeeraka*, *Dalchini*, *Pippali*, *Maricha* and *Sarkara*. In pharmaceutical study, preliminary physico-chemical analysis showed that hardness of *Yavanishadavadi Vati* was hardness 6.6Kg/cm<sup>2</sup>, ash value 10.59%w/w, loss on drying 8.17%w/w, water soluble extract 28.6%w/w, alcohol soluble extract 20.2%w/w and pH value was 6.5. HPTLC analysis showed eleven spots in 254nm and nine spots in 365nm. **Conclusion:** Present work was carried out to standardize the polyherbal formulation *Yavanishadavadi Vati* in terms of its identity, quality and purity. Pharmacognostical and physico-chemical observations revealed the specific characters of all the active constituents in the preparation.

INTRODUCTION

For the present study, *Yavanishadavadi Vati*<sup>[1]</sup>, a polyherbal formulation contains different amount of twelve herbal drugs [Table no.1] that is *Yavani* (*Trachyspermum ammi* Linn.), *Tintidaka* (*Rhus parviflora* Roxb.), *Shunthi* (*Zingiber officinale* Roxb.), *Amalvetasa* (*Garcinia indica* Roxb.), *Dadima* (*Punica granatum* Linn.), *Badara* (*Ziziphus mauritiana* Lam.),

*Dhanyaka* (*Coriander sativum* Linn.), *Suvarchal Lavana* (black salt), *Jeeraka* (*Cuminum cyminum* Linn.), *Dalchini* (*Cinnamomum zeylanicum* Breyn.), *Pippali* (*Piper longum* Linn.) (*Maricha* (*Piper nigrum* Linn.) and *Sarkara* (sugar).

In *Yavanishadavadi Vati*, ingredients like *Shunthi*, *Maricha*, *Pippali*, in this *Vati* will help in maintaining the normal state of *Agni*. *Yavani* and other ingredients like *Dadima*, *Badara*, *Dhanyaka*, *Jeeraka* have *Deepana* and *Pachana* properties. *Yavani* has also *Shothhara* properties and contain flavonoids and glycosides which inhibit the prostaglandin synthesis thus may improve the ESR level which is highly raised in tubercular patients.<sup>[2]</sup>

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## AIMS AND OBJECTIVES

1. To evaluate raw drugs of *Yavanishadavadi Vati* for authenticity through various pharmacognostical procedures.
2. To develop the pharmacognostical and phyto-chemical profile *Yavanishadavadi Vati*.

## MATERIALS AND METHODS

### Collection, Identification and Authentication of raw drugs

The raw materials were collected from the pharmacy of, Institute of Teaching and Research in Ayurveda Jamnagar. All the raw drugs were identified and authenticated in the Pharmacogonosy Laboratory, Institute of Teaching and Research in Ayurveda Jamnagar.

### Preparation of Drug

The fine powder of *Yavani*, *Tintidaka*, *Shunthi*, *Amalvetasa*, *Dhanyaka*, *Suvarchal Lavana*, *Jeeraka*, *Dalchini*, *Maricha* in fixed proportion had been taken and mixed well. Then *Dadima* and *Badara Swaras Bhavna* had been given to the mixture. At last, 16 parts of fine powder of sugar was added during *Bhavna* process and *Vati* prepared of the size of one *Shana matra*.

Weight of each *Vati*, about 500mg. Shape: Round shape Size: About 0.5cm, greenish greyish in colour with characteristic odour, Hard to touch. Storage: Kept in well closed polythene bags. Ingredients of *Yavanishadavadi Vati* are as shown in (Table no. 1) This *Vati* was analyzed using various standard physicochemical parameters such as, Loss on drying, pH, water soluble extract, and methanol soluble extract at the pharmaceutical chemistry lab, ITRA, Jamnagar.

### Pharmacognostical Study

The pharmacognostical study comprises of organoleptic study and microscopic study of finished product.

### Organoleptic Study

The organoleptic characters of polyherbal drugs are very important and give the general idea regarding the genuinity of the sample. Organoleptic parameters i.e., taste, colour, odour and touch of *Yavanishadavadi Vati* were scientifically studied as per the standard references.

### Microscopic Study

*Yavanishadavadi Vati* was powdered and dissolved with water and microscopy of the sample was done without stain and after staining with phloroglucinol + HCL. Microphotographs of *Yavanishadavadi Vati* were also taken under Corlzeisstrinocular microscope.<sup>[3]</sup>

## Physico-Chemical Analysis

*Yavanishadavadi Vati* as analyzed using various standard physico-chemical parameters. The common parameters mentioned for compressed tablets in Ayurvedic Pharmacopeia of India <sup>[4]</sup>, and CCRAS <sup>[5]</sup>, guidelines are loss on drying, total ash value, acid insoluble ash, pH value, water soluble extract, methanol soluble extra total ash, and water and alcohol soluble extractives.

### High Performance Thin Layer Chromatography (HPTLC)

Methanol extract of *Yavanishadavadi Vati* were spotted on pre coated silica gel GF 60254 aluminium plate as 5mm bands, 5mm apart and 1cm from the edge of the plates, by means of a Camag Linomate V sample applicator fitted with a 100 $\mu$ L Hamilton syringe. Toluene (7ml), ethyl acetate (2ml), acetic acid (1ml) was used as mobile phase. After Development, Densitometric scanning was performed with a Camag TLC scanner III in reflectance absorbance mode at 254nm and 366nm under control of win CATS software (V 1.2.1 Camag). The slit dimensions were 6 mm x 0.45 mm and the scanning speed was 20 mm.<sup>[6,7]</sup>

## RESULTS AND DISCUSSION

### Organoleptic characters of *Yavanishadavadi Vati*

Organoleptic characters contents of *Yavanishadavadi Vati* like colour, taste, touch, odor were recorded. The color of *Yavanishadavadi Vati* greenish grey. *Yavanishadavadi Vati* contains its characteristic smell and *Tikta* taste which is shown in Table no. 2.

### Microscopic Study of *Yavanishadavadi Vati*

Identifying characters of ingredients of *Yavanishadavadi Vati* under the microscope were Annular vessels of *Yavani*, black debris of black salt, black debris of *Marich*, bottle neck shaped stone cells of *Pippali*, brown content of *Tintidaka*, cork cells in the surface of *Twak*, fibres of *Amalvetasa*, lignified fibres of *Badara*, mesocarp with tannin of *Pippali*, oil globules of *Jeeraka*, parenchyma with brownish content of *Badara*, parenchyma cells with oil globules of *Dhanyaka*, cork cells of *Shunthi*, endosperm cells of *Yavani* and stone cells of *Dadima*. [Plate no. 1(1 to -15)].

### Physico-chemical analysis of *Yavanishadavadi Vati*

Physico-chemical analysis of *Yavanishadavadi Vati* revealed the value as hardness 6.6 Kg/cm<sup>2</sup>, ash value 10.59%w/w, loss on drying 8.17%w/w, water soluble extract 28.6%w/w, alcohol soluble extract 20.2%w/w and pH value was 6.5. [Table no.3]

### High performance thin layer chromatography of *Yavanishadavadi Vati*

On performing HPTLC, visual observation under UV light showed few spots but on analyzing under densitometer much more was observed and at

254nm, the chromatogram showed 9 peaks with Rf values 0.26, 0.46, 0.57, 0.61, 0.74, 0.82, 0.87, 0.95, 0.99. While at 366nm the chromatogram showed 6 peaks with Rf values 0.26, 0.35, 0.46, 0.65, 0.79, 0.99 [Table no. 4]

**Table 1: Ingredients of Yavanishadavadi Vati**

S.no.	Name of Drugs	Latin name	Parts	Proportion
1.	Yavani	<i>Trachyspermum ammi</i> Linn.	Fruit	2 part
2.	Tintidaka	<i>Rhus parviflora</i> Roxb.	Fruit	2 part
3.	Shunthi	<i>Zingiber officinale</i> Roxb.	Rhizome	2 part
4.	Amalvetasa	<i>Garcinia indica</i> Roxb.	Fruit	2 part
5.	Dadima	<i>Punica granatum</i> Linn.	Fruit	2 part
6.	Badara	<i>Ziziphus mauritiana</i> Lam.	Fruit	2 part
7.	Dhanyaka	<i>Coriander sativum</i> Linn.	Seed	1 part
8.	Suvarchal Lavana	Black salt	-	1 part
9.	Jeeraka	<i>Cuminum cyminum</i> Linn.	Seed	1 part
10.	Dalchini	<i>Cinnamomum zeylanicum</i> Breyn.	Stem Bark	1 part
11.	Pippali	<i>Piper longum</i> Linn.	Fruit	4 part
12.	Maricha	<i>Piper nigrum</i> Linn.	Fruit	2 part
13.	Sarkara	Sugar	-	16 part

**Table 2: Organoleptic characters of Yavanishadavadi Vati**

Drug	Color	Odour	Taste	Consistency
Yavanishadavadi Vati	Greenish Grey	Characteristic	Tikta	Hard


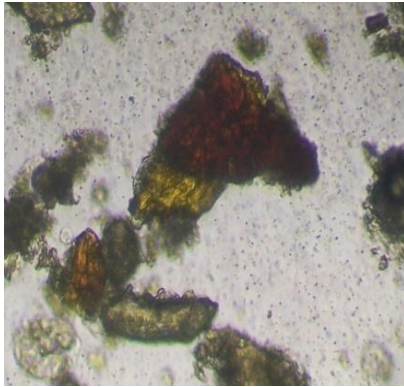
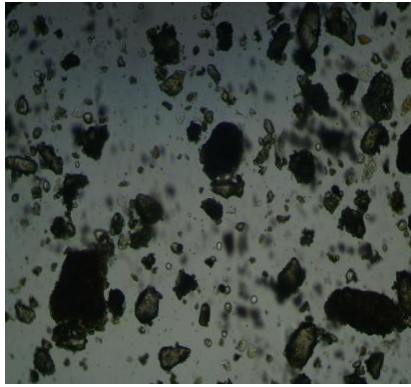
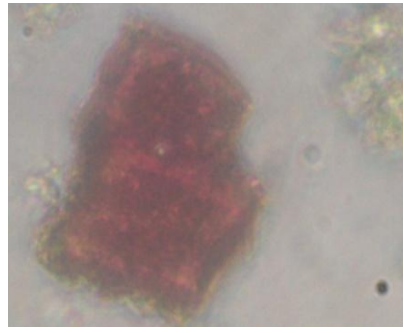
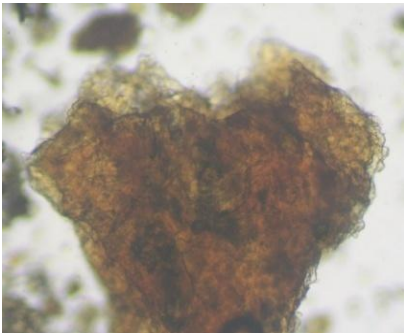
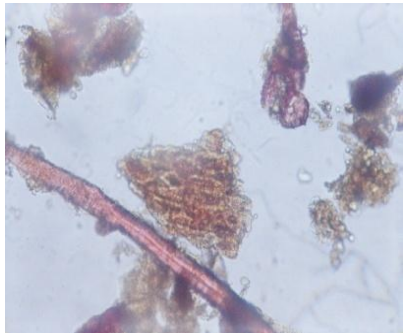


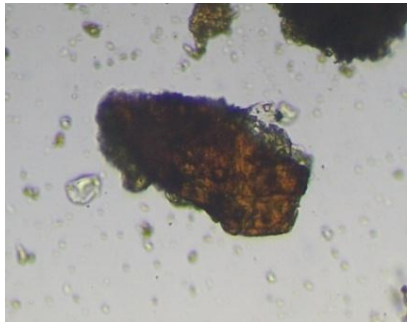
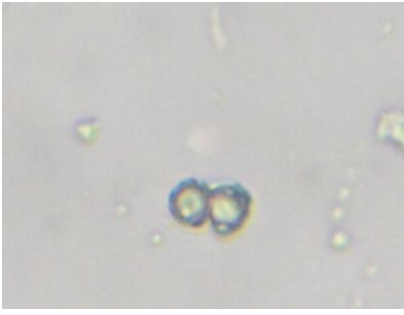
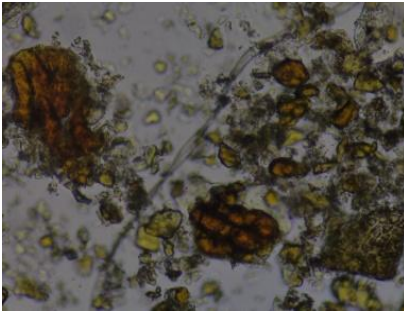
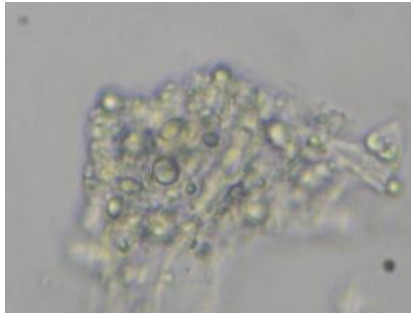
**Table 3: Physico-chemical Parameters of Yavanishadavadi Vati**

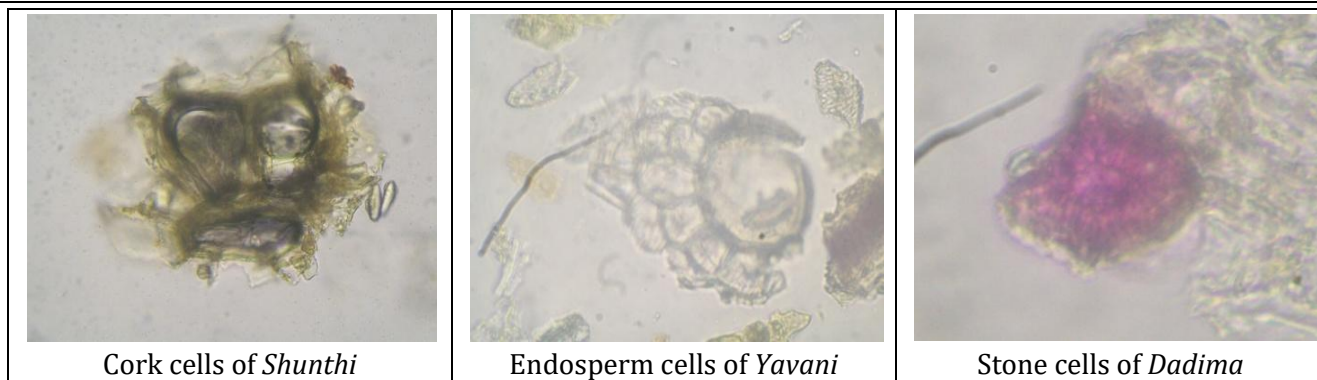
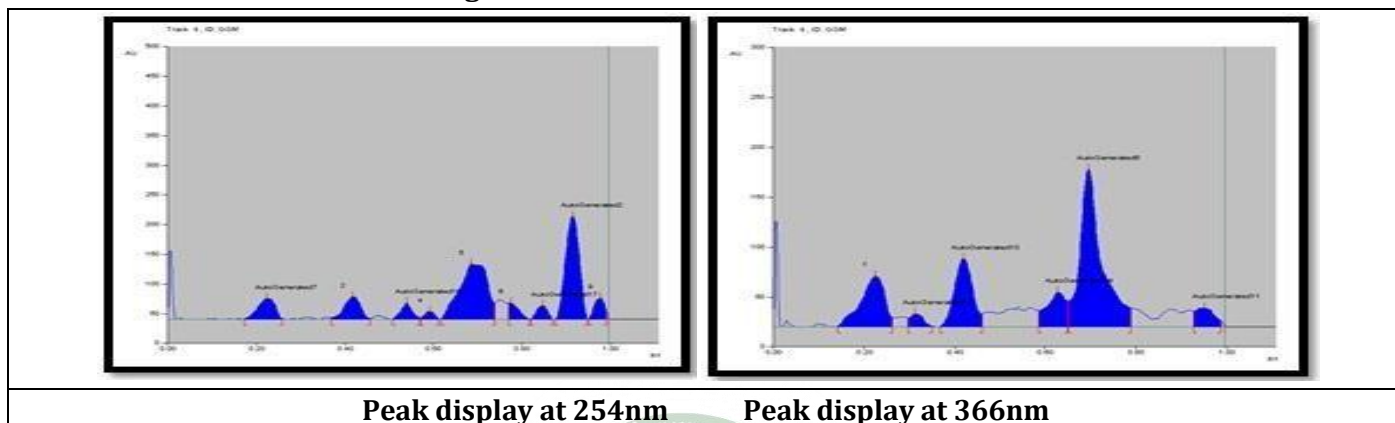
Name of the Analysis	Value of Yavanishadavadi Vati
Loss on drying percentage	8.17% w/w
Ash value	10.59%w/w
PH value (5% aqueous)	6.5
Water soluble extract percentage	28.6% w/w
Alcohol soluble extract percentage	20.2% w/w
Weight variation	Average wt. 485.55mg Highest wt. 535mg Lowest wt. 398 mg

**Table 4: HPTLC results for methanolic extract of Yavanishadavadi Vati**

At 254nm		At 366nm	
No. of spots	Rf Value	No. of spots	Rf Value
9 spots	0.26, 0.46, 0.57, 0.61, 0.74, 0.82, 0.87, 0.95, 0.99	6 spots	0.26, 0.35, 0.46, 0.65, 0.79, 0.99

Plate no. 1: Microphotographs of *Yavanishadavadi Vati*

		
Annular vessels of <i>Yavani</i>	Black debris of black salt	Black debris of <i>Marich</i>
		
Bottle neck shaped stone cells of <i>Pippali</i>	Brown content of <i>Tintidaka</i>	Cork cells in the surface of <i>Twak</i>
		
Fibres of <i>Amalvetasa</i>	Lignified fibres of <i>Badara</i>	Mesocarp with tannin of <i>Pippali</i>
		
Oil globules of <i>Jeeraka</i>	Parenchyma with brownish content of <i>Badara</i>	Parenchyma cells with oil globules of <i>Dhanyaka</i>

Plate no. 2: Densitogram of *Yavanishadavadi Vati* at 254nm and 366nm

Peak display at 254nm

Peak display at 366nm

**CONCLUSION**

The Pharmacognostical and physico-chemical analysis of *Yavanishadavadi Vati* confirmed the purity and genuinity of the drug. Published information is not available on pharmacognostical and physico-chemical profiles of *Yavanishadavadi Vati*. Information acquired from this study may be beneficial for further research work and can be used as a reference standard for quality control researches.

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