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PHARMACOGNOSTICAL AND PHARMACEUTICAL ANALYSIS OF VASADI VATI IN THE MANAGEMENT OF TAMAKA SHWASA W.S.R. TO BRONCHIAL ASTHMA

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ABSTRACT

Tamaka Shwasa is a *Swatantra Vyadhi* & having its own etiology, pathology & management. Its clinical feature resembles with the Bronchial asthma, a very distressing disease of respiratory system producing dyspnoea & discomfort, making life miserable. The GINA report 2012 says, Asthma is a serious global health problem. *Vasadi Vati* is mentioned in classical text of *Yogratnakar* in *Shwasa chikitsa adhyay*, which contains *Vasa*, *Haridra*, *Dhanyaka*, *Guduchi*, *Bharangi*, *Pippali*, *Sunthi*, *Kantakari* and *Marich*. Till date there is no reference regarding scientific analysis of *Vasadi vati*, so the present work was carried out to standardize the finished product *Vasadi vati* to conform its identity, quality and purity. The presence of Trichome, Aloerone grains, Epicarp cells along with oil globule, Simple and compound starch grains, Border pitted vessels, Collenchyma cells were the characteristic features observed in the microscopy of drug. Physico-chemical analysis shows water soluble extract is 31.1 % w/w and PH is 6.0. High Performance Thin Layer Chromatography (HPTLC) at 254nm and 366nm resulted into 10 & 9 spots respectively.

Keywords: *Vasadi vati*, *Tamaka Shwasa*, Pharmacognosy, HPTLC.

INTRODUCTION

Shwasa Roga may be defined simply as a disease in which the respiration and exchange of air is disturbed. *Shwasa* is classified in following types-*Maha Shwasa*, *Urdhva Shwasa*, *Chhinna Shwasa*, *Tamaka Shwasa*, *Kshudra Shwasa*.

Tamaka Shwasa is a *Swatantra Vyadhi* & having its own etiology, pathology & management. It is mentioned as *Yapya Vyadhi* i.e. chronic in nature. The nomenclature of *Tamaka Shwasa* is due to the fact that, the symptoms or attack of this disease precipitates at night and also during the time of attack, the breathing difficulty is so severe that patient feels entering into the darkness. Both the *Vata* and *Kapha* have been considered to be the chief *Doshas* involved in the pathogenesis of *Tamaka Shwasa*. When *Vata* is obstructed by vitiated *Kapha*, get reverses and afflicting the *Pranavaha srotas* and producing dyspnoea associated with wheezing sound, coryza, painful respiration etc [1]. Its clinical feature resembles with the Bronchial asthma, a very distressing disease of respiratory

system producing dyspnoea & discomfort, making life miserable. The GINA report 2012 says, Asthma is a serious global health problem. People of all ages in countries throughout the world are affected by this chronic airway disorder that, when uncontrolled, can place severe limits on daily life and is sometimes fatal. The prevalence of asthma is increasing in most countries, especially among children. Asthma is a significant burden, not only in terms of health care costs but also of lost productivity and reduced participation in family life [2].

According to WHO estimates, 235 million people suffer from Asthma. Asthma is not just a public health problem for high income countries, it occurs in all countries regardless of level of development. Over 80% of asthma deaths occur in low and lower-middle income countries [3]. Till date there is no reference regarding scientific analysis of *Vasadi vati*, so the present work was carried out to standardize the finished product *Vasadi vati* to conform its identity, quality and purity.

MATERIALS AND METHODS

Collection, Identification and Authentication of raw drugs

Properly dried raw drugs viz, *Vasa*, *Haridra*, *Dhanyaka*, *Guduchi*, *Bharangi*, *Pippali*, *Sunthi*, *Kantakari* and *Marich* were obtained from the Department of Pharmacy, I.P.G.T. & R.A., G.A.U., Jamnagar. All the drugs were confirmed to be authentic and of good quality by the Pharmacognosy Laboratory, I.P.G.T. & R.A., G.A.U., Jamnagar. The API standards were used for authentication [4]. *Vasadi Vati* was prepared as per classical reference and physicochemical analysis of the final product was carried out in the laboratory of I.P.G.T. & R.A.

Method of Preparation of *Vasadi vati*

The pre authenticated raw drugs enlisted from 1 to 9 (Table-1) were taken for the preparation. *Vasadi vati* was prepared from the equal quantity of each *dravya* in powder form. The classical formulation of the *Vasadi Vati* is mentioned in classical text of *Yogratnakar* in *Shwasa chikitsa adhyay* in the form of *Kwath* (Decoction form). But here the formulation is changed and is considered in the form of *VatiKalpana* [5].

Pharmacognostical evaluation

The purpose of the pharmacognostical study was to confirm the authenticity of the drugs used in the preparation of *Vasadi vati*. Pharmacognostical evaluation of *Vasadi vati* based on Organoleptic characters i.e. colour, taste, odour and texture were recorded. Small quantity of *Vasadi vati* dissolved in distilled water and filtered through filter paper then filtrate is dried and placed on slide, first observed in plain water and then stained with Phluroglucinol and concentrated HCl to study the characters of the drug. The micro-photographs were taken by using corl-zeiss Trinocular microscope attached with camera [6].

Physico-chemical analysis

In Physicochemical parameters loss on drying, ash value, viz., total ash, acid insoluble ash and extractive values viz., methanol soluble extractive value, water

soluble extractive value and pH value etc. were determined as per the API guideline [7]. HPTLC were carried out after making appropriate solvent system with Methanolic extract of *Vasadi vati* at the Pharmaceutical chemistry lab, I.P.G.T. & R.A.

RESULTS

Pharmacognostical analysis

Organoleptic characters of *Vasadi vati* like colour, odour, taste and texture are described in the Table-2. Microscopic study of *Vasadi vati* showed that Trichome of *Vasa*, simple starch grains with hilum of *Haridra*, aloerone grains of *Dhanyaka*, epicarp cells of *Dhanyaka* along with oil globule, sclerenchymatous cells of *Dhanyaka*, border pitted vessels of *Guduchi*, simple and compound starch grains of *Guduchi*, collenchyma cell of *Guduchi*, prismatic crystals of *Bharangi*, rhomboidal crystals of *Bharangi*, border pitted vessels of *Bharangi*, dark yellow content of *Bharangi*, pitted stone cells of *Bharangi* with wide lumen, stone cells of *Bharangi*, black debbrries of *Pippali*, group of stone cells of *Pippali*, starch grains of *Sunthi*, oil globules of *Sunthi*, fibres of *Sunthi*, oleoresin content of *Sunthi*, epicarp cells of *Kantakari*, fibres of *Kantakari*, simple trichome of *Kantakari*, compound trichome of *Kantkari*, stone cells of *Marich*, bottle neck shaped stone cells of *Marich* (Plate-1).

Physicochemical analysis

Physicochemical analysis (Table-3) of *Vasadi vati* showed water soluble extract 31.1% w/w, methanol soluble extract 18% w/w, total ash content 13.93% w/w, acid insoluble ash 3.48% w/w, pH 6.0 and loss on drying 5.4% w/w.

HPTLC study results

On performing HPTLC, visual observation under UV light showed few spots but on analyzing under densitometer much more was observed (Plate-2) and at 254nm, the chromatogram showed 10 peaks with Rf values 0.02, 0.08, 0.21, 0.30, 0.45, 0.69, 0.75, 0.80, 0.95, 1.00 While at 366nm the chromatogram showed 9 peaks with Rf values 0.02, 0.07, 0.21, 0.34, 0.44, 0.61, 0.75, 0.93, 1.00 (Table-4 and Plate-3).

Table 1. Ingredients of *Vasadi vati*

| Name of Drug | Botanical name | Part used | Part |
|--------------|---|-------------|--------|
| Vasa | <i>Adhatoda vasica</i> Nees | Whole plant | 1 part |
| Haridra | <i>Curcuma longa</i> Linn. | Rhizome | 1 part |
| Dhanyaka | <i>Coriandrum sativum</i> Linn | Seed | 1 part |
| Guduchi | <i>Tinospora cordifolia</i> (Willd.) Miers. | Stem | 1 part |
| Bharangi | <i>Clerodendrum serratum</i> Linn. | Root | 1 part |
| Pippali | <i>Piper longum</i> Linn. | Fruit | 1 part |
| Sunthi | <i>Zingiber officinale</i> Roxb. | Rhizome | 1 part |
| Kantakari | <i>Solanum xanthocarpum</i> Schrad.& Wendl | Whole plant | 1 part |
| Marich | <i>Piper nigrum</i> Linn. | Fruit | 1 part |

Table 2. Organoleptic characters of Vasadi vati

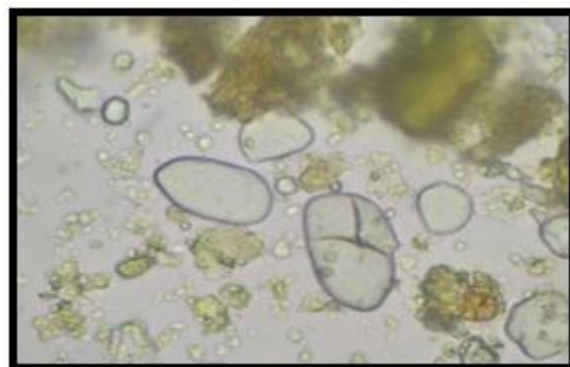
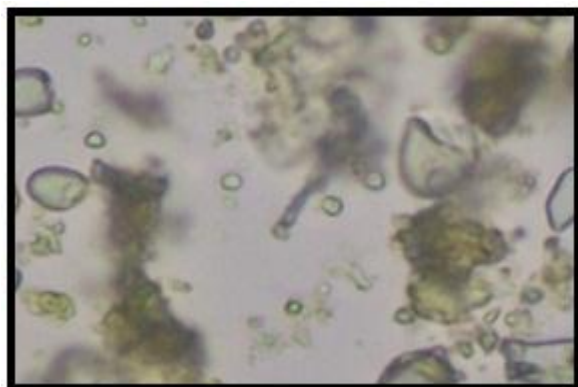
| No | Parameters | Observation |
|----|-------------|--------------------------------|
| 1 | Colour | Yellowish brown |
| 2 | Odour | Bitter |
| 3 | Taste | <i>Kashaya, Tikta and Katu</i> |
| 4 | Consistency | Solid |

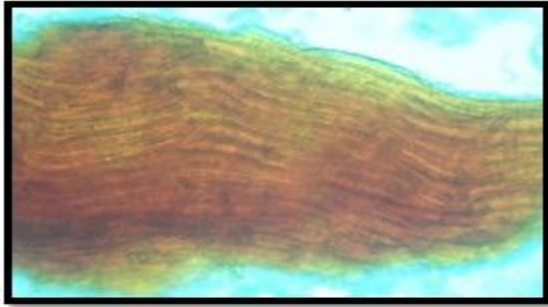
Table 3. Physico-Chemical Parameters

| Sr. No. | Analytical parameters | Results | | |
|---------|--------------------------|------------------------|-------------|------------|
| | | Avg. Wt. | Highest Wt. | Lowest Wt. |
| 1 | Uniformity of tablet | 0.650gm | 0.687gm | 0.599gm |
| 2 | Loss on drying | 5.4% w/w | | |
| 3 | Ash value | 13.93% w/w | | |
| 4 | Acid Insoluble Ash | 3.48% w/w | | |
| 4 | Water soluble extract | 31.1% w/w | | |
| 5 | Methanol soluble extract | 18% w/w | | |
| 6 | pH | 6.0 | | |
| 7 | Hardness | 1.21kg/cm ² | | |

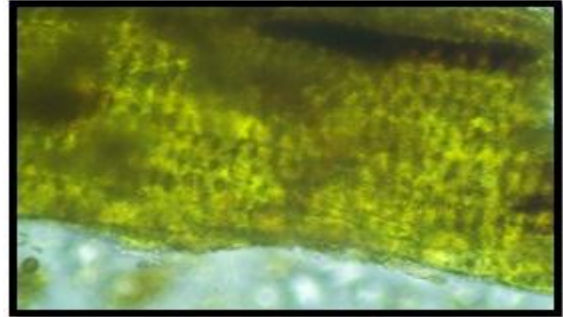
Table 4. Results of HPTLC

| Extract | Solvent system | Wavelengths | Spots | Rf value |
|----------|--|-------------|-------|---|
| Methanol | Toluene: Ethylacetate: Acetic Acid (7:2:1) | 254 nm | 10 | 0.02, 0.08, 0.21, 0.30, 0.45, 0.69, 0.75, 0.80, 0.95, 1.00 |
| | | 366 nm | 9 | 0.02, 0.07, 0.21, 0.34, 0.44, 0.61, 0.75, 0.93, 1.00 |

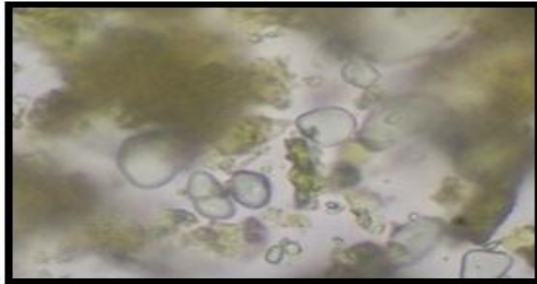
Plate 1. Microphotographs of Vasadi vati**Trichome of Vasa****Simple starch grains with hilum of Haridra****Aloerone grains of Dhanyaka****Epicarp cells of Dhanyaka along with oil globule**



Sclerenchymatous cells of Dhanyaka



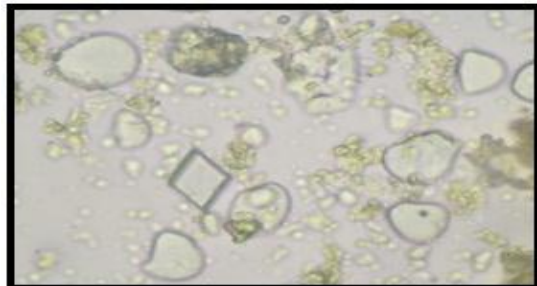
Border pitted vessels of Guduchi



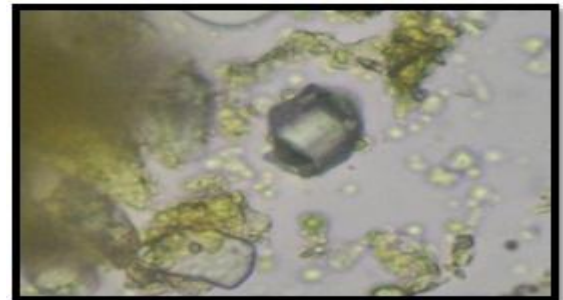
Simple and compound starch grains of Guduchi



Collenchyma cells of Guduchi



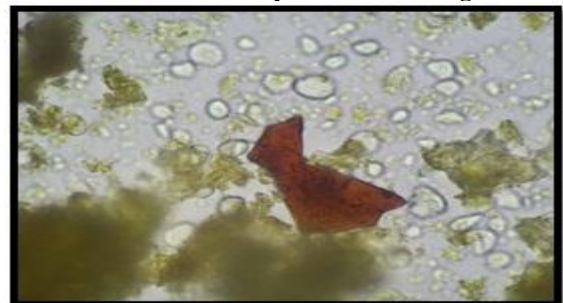
Prismatic crystals of Bharangi



Rhomboidal crystals of Bharangi



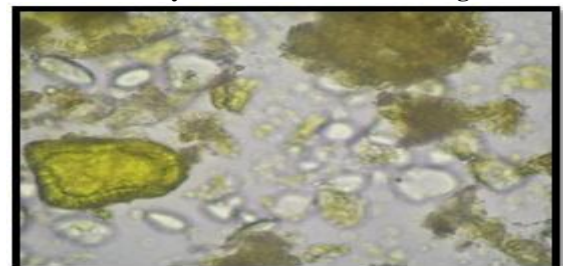
Border pitted vessels of Bharangi



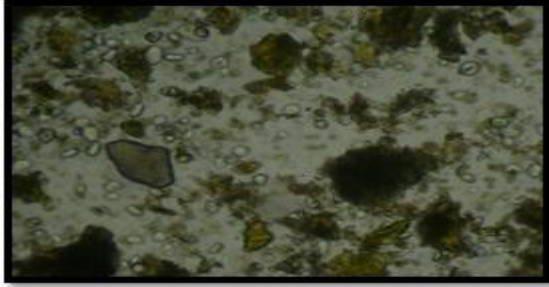
Dark yellow content of Bharangi



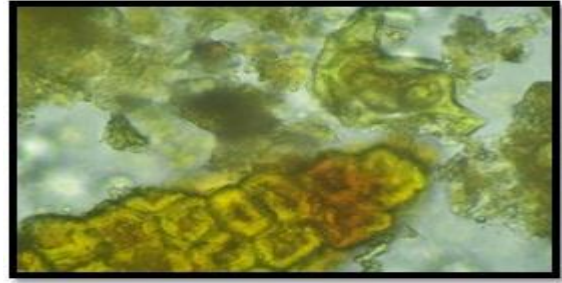
Pitted stone cells of Bharangi with wide lumen



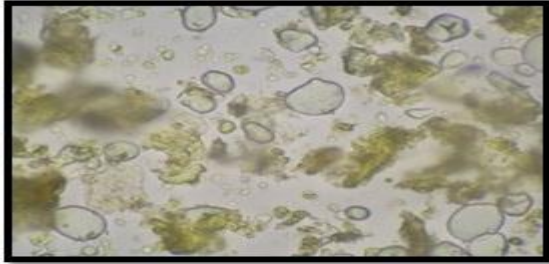
Stone cells of Bharangi



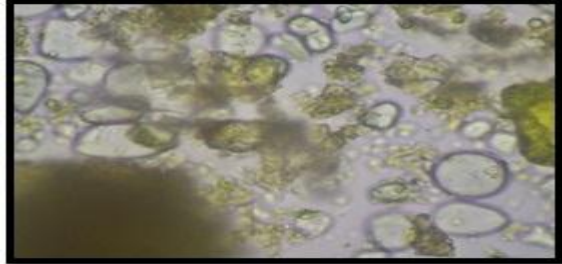
Black debbries of Pippali



Group of Stone cells of Pippali



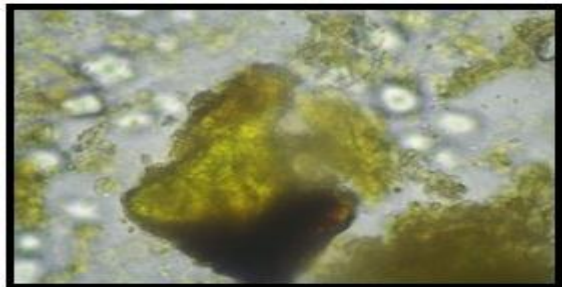
Starch grains of Sunthi



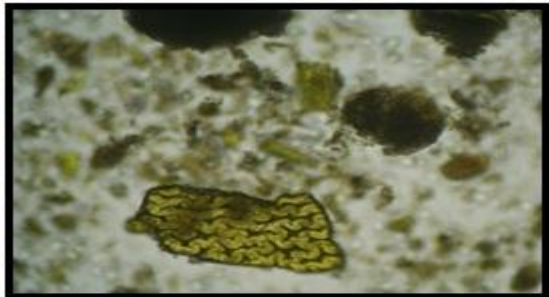
Oil globules of Sunthi



Fibres of Sunthi



Oleoresin content of Sunthi



Epicarp cells of Kantakari



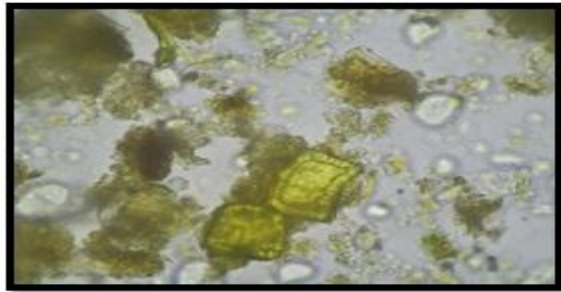
Fibres of Kantakari



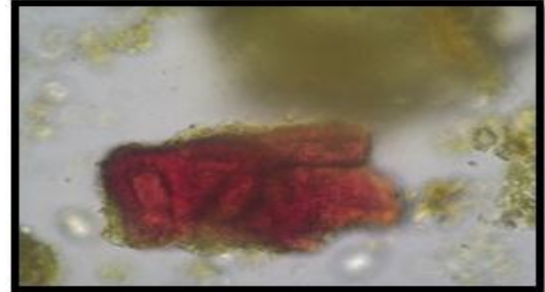
Simple trichome of Kantakari



Compound trichome of Kantakari

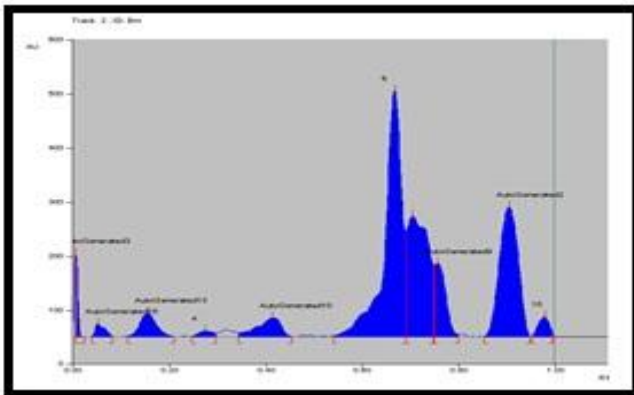


Stone cells of Marich

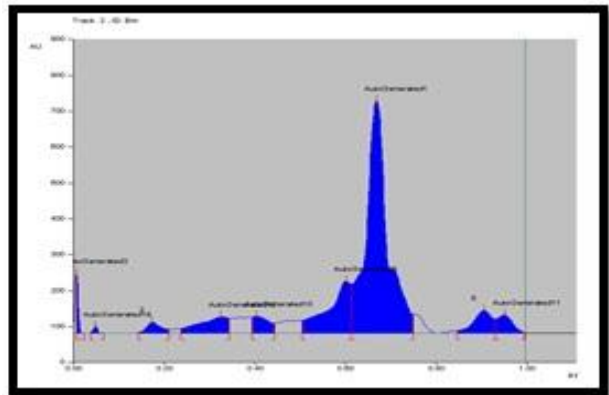


Bottle neck shaped stone cells of Marich

Plate 2. Densitogram of Vasadi Vati

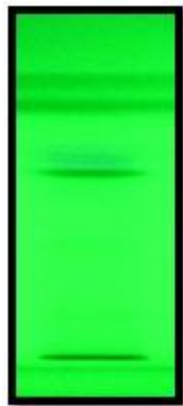


Densitogram curve of Methanolextract of *Vasadi vati* at 254 nm



Densitogram curve of Methanolextract of *Vasadi vati* at 366 nm

Plate 3. HPTLC plates of Methanolic Extract of Vasadi Vati



254nm



366nm

DISCUSSION

Pharmacognostical study helps in authentication of the commonly used drugs through morphological and physico-chemical parameters and it can prevent the accidental misuse of drugs and also adulteration to a greater extent. *Vasadi vati* consist of 9 herbal ingredients which were proved to be genuine by assessing the Pharmacognostical parameters. The Physicochemical parameters showed Water soluble extract is 31.1%w/w

&methanol soluble extract is 18%w/w. Total ashes are designed to measure the total amount of material remaining after ignition. Ash value of test drug is 13.93%w/w and Acid Insoluble Ash is 3.48%w/w. pH is the measure of acidity or basicity of a solution. In the present sample pH is 6.0 showing the acidic nature of the solution. Loss on drying of this drug is 5.4%w/w. Microscopy of *vasadi vati* showed the striking characters of all individual 9 drugs of final product. It confirms the ingredients present in the

finished product and there is no major change in the microscopic structure of the raw drugs during the pharmaceutical processes of preparation of *vasadi vati*. HPTLC showed a difference of results when the sample scanned at two wavelengths i.e. 254 nm and 366 nm having 10 and 9 spots respectively. This shows presence of certain constituents and is helpful for the easy separation of these constituents.

CONCLUSION

Pharmacognostical findings confirm the ingredients present in the *Vasadi vati* and raw drugs cross

verified with API, there is no major change in the microscopic structure during the pharmaceutical processes of preparation of *vati*. The results of this study may be used as the reference standard in further research undertakings of its kind.

ACKNOWLEDGEMENT

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