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RESEARCH ARTICLE

Pharmacognostical and Pharmaceutical Evaluation of *Vasa Avaleha* – An Ayurvedic Compound

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ABSTRACT

In Ayurveda, Kasa can co-relate with cough that is a clinical condition. The mechanism of cough reflex in modern medical science is exactly correlates with pathophysiology of disease Kasa. Respiratory tract complaints are experience in higher rate and cough is most frequent symptom found in Paediatric OPD. Recurrent cough found as the manifestation of recurrent respiratory disease. So, to treat the disease Kasa, Vasa Avaleha (VA) was taken from Bhaishajya Ratnavali, well-known text of Ayurveda. The present work was carried out to standardize the finished product VA to conform its identity, quality and purity. The pharmacognostical work reveals that presence of Upper epidermis, Palisade, Lower epidermis, covering trichome, Vascular bundle, Multicellular trichome, Diacytic stomata, sessile glandular trichome, Xylum, Phloem etc. from leaf of Adhatoda Vasica Nees. Oleoresin, Stone cell, Oil globules, Brown content etc. had observed microscopically from fruit of Piper longum Linn. Organoleptic features of VA made out of the crude drugs were within the standard range as mentioned in the classic. The pH value of VA was 5.5, Water-soluble extract was 70 %w/w, Loss on drying was 19.18 %w/w, Reducing sugar was 29.90 %w/w and High Performance Thin Layer Chromatography (HPTLC) at 254nm and 366nm resulted into 8 & 4 spots respectively.

Key words: HPTLC, Recurrent Respiratory Disease, Vasa Avaleha, Pharmacognosy, Pharmaceutics.

INTRODUCTION

Cough is a protective reflex, occurs due to the irritation of the mucus membrane of the larynx or tracheo-bronchial tree. The larynx and carina are especially sensitive to corrosive chemical stimuli, such as sulphur dioxide gas and chlorine. Afferent impulses pass from the respiratory passages mainly through the vagus nerve to the medulla. An automatic sequence of events is trigger to the medulla causing the following effect, which expelled out the cough [1]. That Pathophysiology clearly co-relate with disease Kasa in Ayurveda explained as - the act with forceful expulsion of *Vayu* along with in-drawing and falling movement of chest wall in other words called as *Kasa* [2]. Non-judicious use of antibiotics and corticosteroids [3] in contemporary system of medicines during present era has led to iatrogenic suppression of host immunity and birth of multidrug resistant traits of pathogens [4]. This phenomenon in turn results in the recurrence of Respiratory Tract Infection (RTI) [5]. In modern system of medicine, anti-biotics, anti-histamines, bronchodilators, cough expectorants etc. are commonly used for the management of RTI. Vasa Avaleha (VA) is an Ayurvedic Compound indicated for the disease Kasa in text Bhaishajya

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Ratnavali[6]. In the present work was carried out to standardize and evaluate the pharmacognostical as well as to analyze the physico-chemical properties of Vasa Avaleha.

MATERIALS AND METHODS

Drug Material:

All the raw drugs except *Vasa* leaves (*Adhatoda vasica* Nees.) were obtained from Pharmacy of Gujarat Ayurveda University, Jamnagar. *Vasa* leaves were collected from local area of Jamnagar city (22° 28' 0"North & 70° 4' 0" East). The ingredients and the part used are given in **(Table 1)**.

Method of Pharmacognostical evaluation:

Raw drugs were identified and authenticated by the Pharmacognosy lab, IPGT&RA, Jamnagar. The identification was carried out based on the morphological features, organoleptic features and transverse section microscopy of the individual drugs. For pharmacognostical evaluation, drugs studied under the Corl zeiss Trinocular microscope attached with camera, with stain and without stain [7]. The microphotographs were also taken under the microscope.

Method of Preparation of the *Vasa Avaleha*:

Method of preparation was adopted as standard procedure from *Sharangdhara Samhita Madhyama Khanda*[8] as method preparation mentioned in **(Figure 1)**.

Method of Physico-chemical evaluation:

Vasa Avaleha was analysed by using standard qualitative and quantitative parameters, HPTLC was carried out after making appropriate solvent system with Methanolic extract of Vasa Avaleha at the Pharmaceutical Chemistry lab, I.P.G.T. & R.A. Gujarat Ayurved University, Jamnagar. Presence of more moisture content in a sample may create preservation problem. Hence loss on drying [9] was also selected as one of the parameters. Water soluble extract [10], Methanol soluble extract [11], pH [12], Reducing, Non-reducing and Total sugar [13] selected as the parameters. Organoleptical parameters, Physico-chemical analysis, investigations were carried out by following standard procedure. High Performance Thin layer chromatography (HPTLC) studies were carried out with acid hydrolysed methanolic extract 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 µL Hamilton syringe. The mobile phase used was Toluene: Ethyl acetate: Glacial acetic acid: Formic acid (5:5:1:0.5). The plates were developed in Camag twin trough chamber (20 x 10 cm^2) and spots were detected in short U.V. (254 nm), Long U.V (366nm). Camag Scanner II (Ver. 3.14) and Cats soft ware (Ver. 3.17) were used for documentation.

RESULTS AND DISCUSSION

Pharmacognostical study:

Microscopically evaluation is very important in the initial identification of ingredients as well as in the detection of adulterations**.** Identification of original drug is the first step to maintain the quality of the final product. The pharmacognostical work reveals that presence of Upper epidermis, Palisade, Lower epidermis, covering trichome, Vascular bundle, Multicellular trichome, Diacytic stomata, sessile glandular trichome, Xylum, Phloem etc. from leaf of Adhatoda Vasica Nees. **(Figure 2 & 3)** Oleoresin, Stone cell, Oil globules, Brown content etc. had observed microscopically from fruit of Piper longum Linn. in microphotographs taken under the microscope. **(Figure 4)**. All the ingredients were authenticated with help of characters mentioned in the API.

Organoleptic study:

Organoleptic features of Vasa Avaleha were observed like semisolid sticky in consistency, greenish brown in colour, characteristic in odour and bitter, sweet-pungent in taste comparing API, Dark brown coloured, semi solid, malleable, sticky preparation with odour of ghee; taste bitter and pungent [14] were found**(Table 2).** All parameters found as per API standards.

Physico- chemical Parameters:

Standardization of herbal products is the need of time because of several reasons. Physico-chemical Parameters of the VA like loss on drying, water soluble extract etc. were examined and found as per **(Table 3)**. Physico-chemical parameters were compared with API. Loss on drying parameter was 19.18% as the humid contains found more in VA. pH found 5.5 which is less acidic as compare to API standards. Reducing sugar, non-reducing and total parameters were found 29.90, 7.12 & 37.02 respectively less as compare to API. All these parameters need evaluation in different size of batches. Also need validation for batch to batch variation.

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HPTLC study results:

On performing HPTLC, visual observation under UV light showed few spots but on analysing under densitometer much more was observed and at 254nm the chromatogram showed 8 peaks, at 366nm the chromatogram showed 4 peaks **(Table 4)**. Eight peaks found at Rf value 0.02, 0.18, 0.22, 0.30, 0.35, 0.46, 0.54 and 0.88 in 254 nm wavelength while Four peaks found at Rf value 0.02, 0.18, 0.30 and 0.35 in 366 nm wavelength. HPTLC could not assess according to standards as the parameter not mentioned in API for the drug VA.

Table 1: Ingredients and Parts Used of Vasa Avaleha

Sanskrit Name	Botanical / English Name	Part used	Parts
Vasa	*Adhatoda vasika* Nees.	Leaf (fresh)	8
Pippali	*Piper longum* Linn.	Fruits (Dry)	1
Go-ghrita	Ghee	-	1
Madhu	Honey	-	4
Sita	Sugar candy	-	4

Table 2: Results of Organoleptic Features

Parameters	API	*Vasa Avaleha*
Consistency	Semi solid, malleable, sticky	Semisolid sticky
Color	Dark brown	Greenish brown
Taste	Bitter and pungent	Bitter- Sweet & Pungent
Odor	Odor of ghee	Characteristic

Table 3: Results Of Physico- Chemical Parameters

Parameters	API	*Vasa Avaleha*
Loss on Drying (110˚C) (% w/w)	Not more than 12.16	19.18
Water soluble extract (% w/w)	Not less than 60	70.0
Methanol soluble extract (% w/w)	Not less than 20	74.9
pH	4.35 – 4.39	5.5
Reducing sugar (% w/w)	44 - 45	29.90
Non- reducing sugar (% w/w)	38 - 43	7.12
Total sugar (% w/w)	83 - 88	37.02

Table 4: Results Of Hptlc Study

	254 nm	366 nm
Rf values	0.02, 0.18, 0.22, 0.30, 0.35, 0.46, 0.54, 0.88	0.02. 0.18, 0.30, 0.35

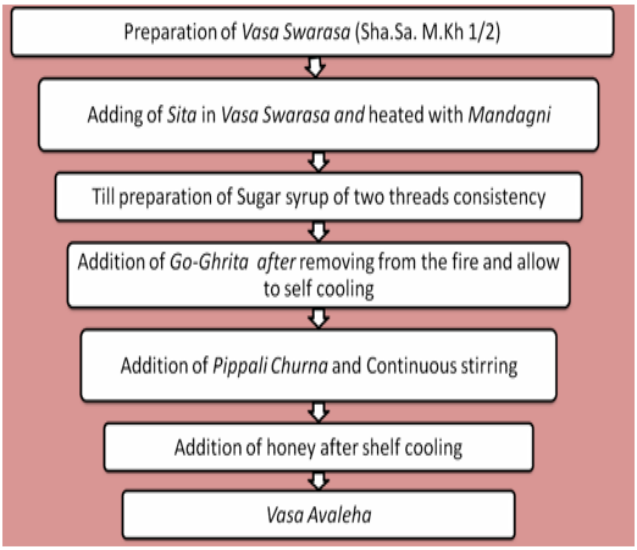

Figure 1: Method of preparation of Vasa Avaleha

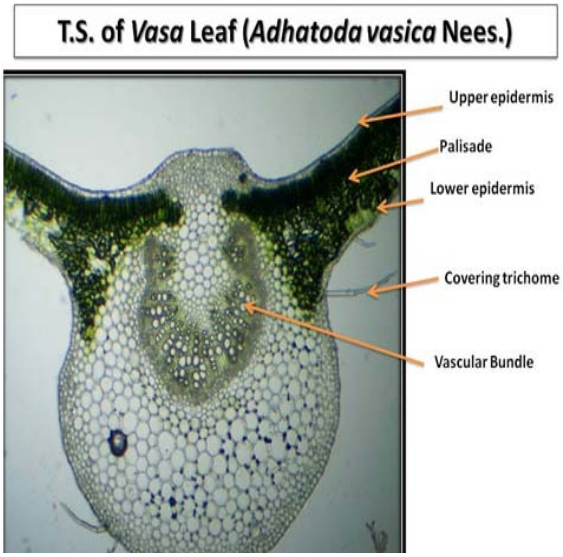

Figure 2: Microscopic characters of Transverse Section of *Vasa Leaf*

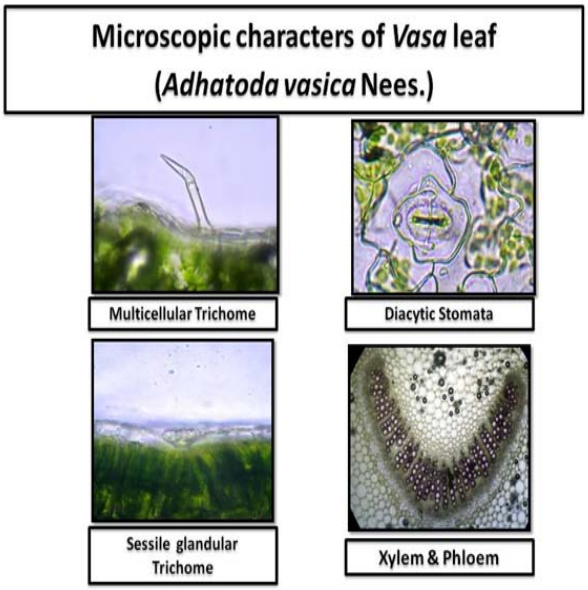

Figure 3: Microscopic characters of *Vasa* leaf

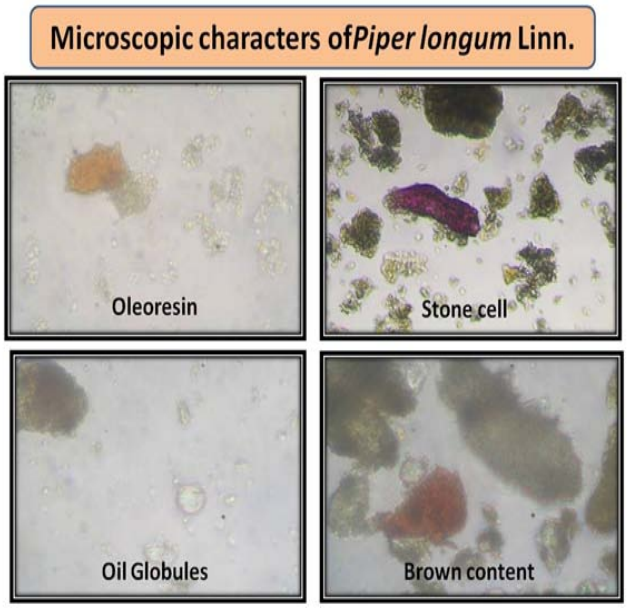

Figure 4: Microscopic characters of *Pippali* fruit

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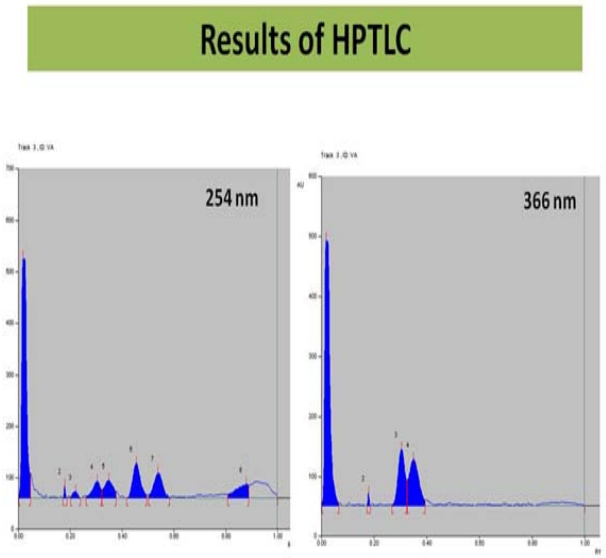

Figure 5: Results of HPTLC

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CONCLUSION

Vasa Avaleha is a potent medicine in the management of disease *Kasa*. Preliminary the morphological features, organoleptic features and transverse section microscopy of the individual drugs results confirm the genuinity and no adulterants found. For authantification, All the ingredients were compared with the parameters mentioned in API (Ayurvedic Pharmacopeia of India). Phyto-chemical analysis had assessed but still need validation through repeated experiment on different batches with quantity of ingredients. These groundwork requisites for the standardization of VA are covered in the current study, additional important analysis and investigations are required for the identification of all the active chemical constituents of the test drug to substantiate the clinical efficacy.

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