



**COMPARATIVE ANALYSIS OF DRY VASA LEAF EXTRACTION PREPARED BY
HIMA KALPANA AND KWATHA KALPANA**

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ABSTRACT

Bhaishajya Kalpana, the Ayurvedic pharmacology is the science that describes the classic and new herbal drug dosage forms. *Swarasa*, the juice is considered the basest dosage form and it is prepared by Two different methods based on the drugs quality. *Vasa*, the *Adhatoda vasica* is a renowned pneumo-curative drug and its juice is prescribed to be extracted by a heating process. If fresh drug is not available then we can use dry vasa leaf for preparation of different swaras kalpana. This study is done to comparatively evaluate the effective method of extraction of *vasa swarasa hima & kwatha kalpana* (but both are not a swarasa kalpana) to extraction, by quantitative estimation of its active principle called vasicine. Three batches of vasa swarasa were prepared by both the methods, samples were collected by simple random sampling method and vasicine was estimated by high performance thin layer chromatography. The *Kwatha (Phanta)* method yielded quantitatively more *swarasa* and the vasicine is also comparatively more than Hima method. Hence Kwatha proves effective in extraction of a more potent Kwath vasa swarasa.

KEYWORDS: *Bhaishajya Kalpana, Adhatoda vasica.*

INTRODUCTION

The pharmacokinetics and dynamics of a drug is dependent on its form. The intellectual minds developed the art of modifying raw drugs into suitable, beneficial dosage forms. In *Ayurveda*, this insidious development is termed as *Bhaishajya Kalpana*. *Bhaishajya Kalpana* is the art and science of preparing and dispensing herbal medicines. The initial basic formulations are called *panchavidha kashaya kalpana*, viz. *swarasa* (juice), *kalka* (paste), *kwatha* (decoction), *hima* (cold infusion) and *phanta* (hot infusion).

Swarasa, the juice is prepared by four different methods. The methods are as follows,

1. (For soft and fresh drugs) the ideal drug is collected, washed, wiped, pounded and squeezed through clean cloth to obtain *swarasa*.
2. (For dry drugs) one *kudava* (187g approx.) of dry drug is soaked in two times of water overnight, next day it is macerated and filtered to obtain *swarasa*.
3. (For dry and hard drugs) eight times of water is added to dry drug, boiled in *mandagni* (mild flame), reduced to ¼ and filtered to obtain *swarasa*.
4. (For drug difficult for extraction) the drug is pounded to paste, packed in big leaves like of *jambu* (*Syzygiumcumini*), *vata* (*Ficus bengalensis*), then covered with clay to a thickness of 2 *angula* (2 fingers breadth

approx.), dried, burnt in fire till red hot, removed from fire, opened and the *kalka* is squeezed in a clean cloth to obtain *swarasa*. *Vasa* (*Adhatoda vasica*) is one among the drugs which require this method for extraction of *swarasa*.

Vasa also known as Malabar nut tree is part of the ACANTHACEAE plant family, is a common small evergreen, sub-herbaceous bush distributed throughout India. *Adhatoda* leaves have been used extensively in Ayurvedic medicine for over 2000 years primarily for respiratory disorders. The leaves and roots contain several alkaloids (chief principle being quinazoline alkaloid, vasicine and vasicinone, vasicinolone and vasicol), which may have a bronchodilator effect of the bronchi. These alkaloids are said to exist in combination with an acid that has been named *adhatoda acid*. Alkaloid vasicine constitutes about 45 to 95% of whole alkaloids (the mucolytic drug bromhexine was developed from this alkaloid). On kinetics, vasicine is rapidly absorbed even through the gut. The rate of metabolism is much faster by hepatic enzyme and is within 30 minutes. Original compound is completely metabolized and vasicine is degraded into vasicinone, deoxyvasicin. The *swarasa* of vasa was prepared by Hima and Kwatha (Phanta) method and the quantity of vasicine is estimated by High Performance Thin Layer Chromatography.

Analytical methods such as photometric analysis, Thin Layer Chromatography (TLC), High Performance Liquid Chromatography (HPLC), High Performance Thin Layer Chromatography (HPTLC), and Gas Chromatography (GC) are employed in order to establish the constant composition of herbal preparations. Depending on whether the active principles of the preparation are known or unknown, different concepts such as "normalization versus standardization" have to be applied in order to establish relevant criteria for uniformity.

TLC is used extensively in the phytochemical evaluation of herbal drugs because it enables rapid analysis of herbal extracts with minimum sample clean-up requirement. It provides qualitative and semi quantitative information of the resolved compounds. In TLC fingerprinting, the data that can be recorded using a high performance (HPTLC) scanner includes the chromatogram, retardation factor (Rf) values, the colour of the separated bands, their absorption spectra, λ max and shoulder inflection/s of all the resolved bands. All of these, together with the profiles on derivation with different reagents, represent the TLC fingerprint profile of the sample. HPLC fingerprinting includes recording of the chromatograms, retention time of individual peaks and the absorption spectra (recorded with a photodiode array detector) with different mobile phases. HPTLC has been investigated for simultaneous assay of several components in a multicomponent formulation. It has been well reported that several samples can be run simultaneously by use of a smaller quantity of mobile phase than in HPLC. HPTLC technique is widely employed in pharmaceutical industry in process development, identification and detection of adulterants in herbal product and helps in identification of pesticide content, mycotoxins and in quality control of herbs and health foods.

MATERIALS AND METHODS

1. Collection of Raw material: Fresh *Vasa patrawas* collected from herbal garden and swarasa was extracted as described in 3 batches. The collected leaves were sorted for yellow leaf. The leaves affected by pests, frost etc were separated and discarded. The selected leaves were cleaned and dry it for making cours powder.

2. Vasa Swarasa: Vasa Swarasa was extracted in Bhaishajya Kalpana laboratory by following classical guidelines of Sharangdhara Samhita.

1. Hima Method

When the fresh herbs are not available this method is utilized to prepare the swarasa. In this method soft and dry herbal material was soaked in twice amount of the water for overnight. Next morning the herbal plant material was macerated and filtered using cloth.

Name of Procedure – Hima method of Extraction of Vasa Swarasa from dry Vasa leaves

Procedure Specification - Hima method

Ingredients - Green Vasa leaves were collected from college's herbal garden and dried in shade

Equipments Required

- Mortar & Pestle
- Mixer
- Stainless Steel Vessels
- Cotton Cloth
- Measuring Cylinder
- Sterile Hand Gloves
- Cap, Mask

Unit Process for Swarasa Preparation

1. Collection of Fresh Vasa

Fresh Vasa leaves were collected from Herbal garden, they were identified and authenticated at Dravyagun department of our college. The collected leaves were sorted for yellow leaf, stem, and flowers. The leaves affected by pests, frost etc were separated and discarded. The selected leaves were cleaned and washed by potable water and wiped with clean cloth. The obtained Vasa leaves are dried in shade in dust free hygienic environment so that fungal contamination was prevented.

2. Pounding of dry Vasa Leaves

The mortar & pastels was cleaned and washed with potable water and dried well. The leaves were measured on weighing scale. The clean vessel was put on weighing scale and scale was tare to zero. The cleaned Vasa leaves were correctly measured 100 gm and taken in mortar & Pastel. The vasa leaves were pounded well so that coarse powder was prepared. It was ensured that the homogenous powder was formed maintaining all aseptic conditions. The coarse powder was passed through 20 no mesh and ensured that it passes the sieve test. The 100 gm course powder of dried vasa leaves was taken in the vessel and 200 ml potable water was added. It is kept for overnight and next day it is again macerated well and taken for filtration.

3. Filtration

The muslin cloth washed with clean water and dried. The cloth was sterilized and well macerated mixture was passed through it. The remaining mixture bolus, by applying slow pressure the bolus was squeezed. The maximum possible Swaras was obtained by squeezing the pottali and collected in measuring flask. And the obtained quantity was measured, the findings and observations are noted. Throughout the procedure all aseptic conditions were maintained strictly.

4. The procedure was repeated for two times and observations were noted.

Hima Swaras Extraction Method

Sr. No.	Method	Ingredients	Part Used	Quantity Taken	Quantity Gain
1	Hima	Vasa	Dry Leaf	100 gm	70 ml
2	Hima	Vasa	Dry Leaf	100 gm	72 ml
3	Hima	Vasa	Dry Leaf	100 gm	69 ml

2. Kwath Method

When the fresh herbs are not available this method is utilized to prepare the swarasa. In this method hard and dry herbal material was boiled with 8 parts of water till it get reduced to ¼th of its original quantity. After that the mixture was filtered using cloth.

Name of Procedure – Kwath method of Extraction of Vasa Swarasa from dry Vasa leaves

Procedure Specification - Kwath method

Ingredients - Green Vasa leaves were collected from college's herbal garden and dried in shade

Equipments Required

- Mortar & Pestle
- Mixer
- Stainless Steel Vessels
- Cotton Cloth
- Bhatti
- Measuring Cylinder
- Sterile Hand Gloves
- Cap, Mask

Unit Process for Swarasa Preparation

1. Collection of Fresh Vasa

Fresh Vasa leaves were collected from Herbal garden, they were identified and authenticated at Dravyagun department of our college. The collected leaves were sorted for yellow leaf, stem, and flowers. The leaves affected by pests, frost etc were separated and discarded. The selected leaves were cleaned and washed by potable water and wiped with clean cloth. The obtained Vasa leaves are dried in shade in dust free hygienic environment so that fungal contamination was prevented.

2. Pounding of dry Vasa Leaves

The mortar & pestle was cleaned and washed with potable water and dried well. The leaves were measured on weighing scale. The clean vessel was put on weighing scale and scale was tare to zero. The cleaned Vasa leaves were correctly measured 100 gm and taken in mortar & pestle. The vasa leaves were pounded well so that coarse powder was prepared. It was ensured that the homogenous powder was formed maintaining all aseptic conditions. The coarse powder was passed through 20 mesh and ensured that it passes the sieve test. The 100 gm coarse powder of dried vasa leaves was taken in the vessel and 200 ml potable water was added and level was noted. Then remaining 600 ml water was added and the vessel was shifted over the bhatti. It is boiled on mild flame till it is reduced to the ¼ th level i.e. noted level. The mixture is allowed to cool for filtration.

3. Filtration

The muslin cloth washed with clean water and dried. The cloth was sterilized and cooled mixture was passed through it. The remaining mixture bolus, by applying slow pressure the bolus was squeezed. The maximum possible Swaras was obtained by squeezing the pottali and collected in measuring flask. And obtained quantity was measured, the findings and observations are noted. Throughout the procedure all aseptic conditions were maintained strictly.

4. The procedure was repeated for two times and observations were noted.

Kwath Swaras Extraction Method

Sr. No.	Method	Ingredients	Part Used	Quantity Taken	Quantity Gain
1	Kwath	Vasa	Dry Leaf	100 gm	200 ml
2	Kwath	Vasa	Dry Leaf	100 gm	200 ml
3	Kwath	Vasa	Dry Leaf	100 gm	200 ml

RESULT

i . An average of 70ml swarasa was obtained by Hima kalpana and average of 200ml swarasa was obtained by Kwatha Kalpana.

ii . Instrumental analysis: HPTLC was carried out in Vasu Research Centre, GIDC Makarpura, Vadodara.

Table: Result of Phytochemical Analysis- HPTLC

Sample	Vasa Leaf Juice	Hima Method	Kwatha Method	Vasicine Standard
R value @ 254 nm	0.66	0.63	0.64	0.65
Area (AUC)	20935.6	5873.1	7541.8	3633.8
% Vasicine	0.0205%	0.0029%	0.0037%	---

CONCLUSION

According to the findings it may be concluded that Kwatha method of swarasa preparation is more efficient to obtain the most effective Vasa Swarasa both quantitatively and qualitatively.

DISCUSSION

According to the findings this study explains that Kwatha Vasa swarasa has more analytical values than Hima for Vasa dry leaves.

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