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Research Article

PHARMACEUTICAL STANDARDIZATION OF HERBAL LOZENGES VASA CANDY

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Abstract

Development of new dosage forms without disturbing the basic principles of Ayurveda is a need for the global acceptance. Vasa Avaleha prepared from Vasa (*Adhatodia vasica* Nees.) and Pippali (*Pipper longum* Linn.) is a well known Ayurvedic preparation mentioned in Bhavprakasha. Avaleha form has few difficulties in the pharmaceutical processing such as shelf life, problems in transportation, unit doses, administration difficulties etc. To overcome these problems and to prepare superior dosage form, in present work attempt has been made to develop new dosage form of Vasa Avaleha by preparing Vasa candy. Aim of the study is to develop new dosage form of Vasa Avaleha into Candy dosage form and their pharmaceutical standardization. Three batch of Vasa candy were prepared by using Ghana of Vasa Kwatha leaf (solid extract obtained from decoction of *Adhatoda vasica* Nees.) and Pipalli churna. Considering the inconveniencies the formulation composition has been converted into Vasa candy. During developing medicament different concentration i.e. in powder form 2%, in semisolid form 1.5% and liquid form 1% were used. Analytical study was also done to develop the analytical profile. Vasa candy is more stable, palatable dosage form, superior for commercial purpose and can be administered at fixed unit dose. Total 1666 candies can be prepared from 5 kg weight of thick mass containing Vasa Ghana, Pippali powder, Sugar and glucose in the ratio 9.72:1:80:53.33 respectively with 3 g average weight of each candy.

Key words: Vasa Avaleha; Vasa Ghana; Vasa candy; *Adhatodia vasica*.

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INTRODUCTION

Vasa (*Adhatoda Vasica* Nees.) is a drug with multi-dimensional activities mentioned in Ayurvedic classic for different ailments such as Tamaka shwasa (bronchial asthama),[1] Raktapitta (hemorrhagic) etc.[2] Mostly utilized dosage forms of Vasa are Vasa kwatha and Vasa Avaleha. Pippali (*Pipper longum* Linn.) is an ingredient in Vasa Avaleha. In classical texts Pippali is used in many diseases such as Shwasa, Kasa, Jwara (fever), Shoola (Colic pain), Hikka, Prameha (diabetes), Jeernajwara and Kustha (skin diseas).[3] Vasa also possesses similar therapeutic properties hence combination of both drugs will a better formulation than single one. Ayurvedic classics hold numerous formulations where Vasa is used as one of the active components.[4] Vasa Avaleha is one amongst them. Avaleha form of this drug is popularly utilized and recently its anti inflammatory activity has been proved.[5] Though it has certain disadvantages such as there is no accuracy of unit doses forms, more content variability, semisolid doses forms are difficult to transport, less palatability and lesser shelf life. To overcome these drawbacks it has been planned to convert the Vasa Avaleha doses form into Vasa candy. It is pure herbal formulation containing Pippali, Vasa, sugar and glucose in its composition. Candy form of dose is palatable, has longer shelf life than Avaleha and fixed unit dose can be easily given.

AIMS AND OBJECTIVE

To prepare Vasa candy as new dosage form for Vasa Avaleha and to evaluate its physico-chemical characteristics.

MATERIAL AND METHODS

Fresh leaves of Vasa were collected from botanical garden and Pippali was procured from Pharmacy garden of Gujrat Ayurved University and utilized after proper authentication.[6] Sita (purified sugar candy) and sugar were purchased from local market of Jamnagar (Swan Company). All ingredients were separated from physical impurity like small stone, sand particle etc. Details of ingredients and their quantity is given in Table 1. Vasa candy was prepared in three steps as given below.

1. Preparation of Vasa Kwatha

Vasa kwatha was prepared as per mentioned in Sharangadhara Samhita.[7] Fresh Vasa leaves (4 kg) were washed with potable water and crushed to facilitate Kwatha preparation. These crushed leaves were taken in stainless steel vessel and 32 liters water was added followed by continuous heating till water reduced to 1/4 of its initial quantity. After that heating was stopped and obtained kwatha was filtered through two folded cloth. This kwatha was utilized for Vasa Ghana preparation.

2. Preparation of Vasa Ghana

Obtained kwatha (8 l) was again taken in another Steel vessel and heated on mild heat till the formation of semisolid form.[8] Heating was stopped when mixture become sticky and semisolid. This mixture was allowed to dry in oven at 50 ^{0}C.

3. Preparation of Vasa candy

Fine powder of Pippali was made by grinding in mixer and sieved through 72 number meshes. Properly dried Vasa Ghana was mixed with Pippali powder, sugar, glucose and water in prescribed quantity. Formed thick syrup was boiled at 80 ^{0}C until it reaches desired concentration. This was again heated up to 140 ^{0}C to convert it into thick mass. This prepared thick mass was then subjected to discharge plate followed by addition of flavor. All mixture was properly mixed by kneading with the help of batch roller to form die. This

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die was utilized to manufacture Vasa candy. The die was further subjected to Pillow pack machine to form Vasa candy. Prepared candies were wrapped in aluminium foil to protect from dust and moisture.[9]

Analytical study

To develop analytical profile Vasa candy the raw material, intermediate product and final product were subjected to test organoleptic characters such as colour, odour, touch, taste and phyico-chemical parameters such as loss on drying at 110^0c,[10] pH,[11] water soluble extractive,[12] methnol soluble extractive,[13] determination of reducing and non reducing sugar,[14] acid content,[15] sulphated ash and qualitative test for various functional groups such as Alkaloid, Tannin, Saponin, Cynogenic glycosides, Flavanoids and Phenol. (Table 2 to 8)

OBSERVATION AND RESULTS

During the preparation Vasa Kwatha, colour of liquid was yellowish green with slightly Tikta (bitter) taste, froth on surface of kwatha was observed at 45^0C temperature. Colour of liquid was changed from yellowish green to olive green at 61^oC temperature. Vapour and frothing was started on surface of Kwatha at 80.66 ^{0}C temperature. After 150 minutes the colour of liquid became greenish yellow. Average total time taken for preparation of Vasa Kwatha was 7.94 hrs and average 7.94 liter Kwatha was obtained from 4 kg of Vasa leaves in three batches. After heating Vasa Kwatha in stainless steel vessel for 6 hours, it was converted into mild sticky mass. After 8 hrs of heating stickiness and adhesiveness to the vessel was increased. Thickness of liquid was gradually increased and after drying in oven brown colour and semi-solid mass was converted into dark brown Vasa Ghana. Taste of Vasa Ghana was Kashaya (astringent) Tikta with characteristic smell. The average quantity obtained was 362.4 g from average 7.94 liter Kwatha. Total 1666 candies were obtained from 5 kg wt of thick mass. Average weight of each candy was 3 g.

DISCUSSION

During the preparation of Vasa Kwatha, stable extensive froth with bubble like structure appeared over the surface of greenish yellow menestrum. It appeared light yellow in colour which may be due to presence of Saponin and Tannin present in Vasa leaf. Initially some of the leaves were floating on water surface, which were gradually settled down at the bottom. During boiling, temperature was maintained between 85-95^{o}C. Continuous stirring was done for proper extraction and to lessen the possible chances of degradation of some active constituent which may decompose due to hydrolysis. Continuous stirring is also needed to facilitate the natural circulation evaporation. Constant observation and continuous stirring are essential in obtaining good quality of Kwatha. In Ghana preparation stirring was continuous to avoid burning of active constituent at the bottom portion. Total 14.8 hour heating was given i.e. up to the liquid become thicker in consistency. Kwatha was further heated to remove watery portion and converted into semisolid form. The content was subjected to mild heat and constant stirring. Before the end point of stage water bath was used to avoid the burning of Ghana. The semi solid content were shifted into tray and subjected to dry under sun light. Average percentage of obtained Ghana was 4.56 g. According to industrial method, Pippali in Vasa Avaleha is considered as Prakshepa dravya. Hence for preparation of Vasa candy, Pippali was added in Vasa Ghana. Both ingredients were mixed homogeneously. Sugar and glucose were mixed in their respective proportion with water to make slurry mass subjected syrups tanks cooks & continues cooking at maintained temperature 80^{o}C. Maximum temperature required for caramelization was 140 ^{o}C.[16]

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Table 1: Ingredients and quantity of drugs utilized for preparation of Vasa candy

Ingredient	Botanical name	Part used	Quantity
Vasa	*Adhatoda vasica* Nees.	Leaf	4 kg
Jala	Potable water		32 liter
Vasa Ghana		Leaf	364.8 g
Pippali	*Piper longum* Linn.	Fruits	37.5 g
Sugar	*Sachharum officinarum* Linn.	Stem	3 kg
Glucose			2 kg

Table 2: Average Organoleptic character of raw material of three batches

Sl. No.	Organoleptic character	Pippali power	Vasa leaves
1	Colour	Greenish	Green
2	Odour	Characteristic	Characteristic
3	Appearance	Dark	Dull
4	Taste	Pungent	Bitter

Table 3: Physicochemical parameter of raw material – Average of three batches

Sl. No.	Parameter (%w/w)	Pippali	Vasa
1	Loss on dry	0.45	0.68
2	Ash value	0.15	0.16
3	Acid insoluble value	0.06	0.05
4	Water soluble extract	30.1	29.2
5	Alcohol soluble extract	22.3	23.2

Table 4: Average Qualitative analysis of pippali and Vasa

Sl. No.	Chemical constituents	Pippali	Vasa
1	Alkaloid	+	+
2	Tannin	+	+
3	Saponin	-	+
4	Cynogenic glycosides	+	+
5	Flavanoids	+	+
6	Phenol	+	+

+ve=present; -ve=absent

Table 5: Showing organoleptic character of Intermediate product

Sl. No.	Characters	Vasa Kwath	Vasa Ghana
1	Rasa(Taste)	Tikta	Tikta
2	Rupa(colour)	Brown	Blakishbrown
3	Gandha(Smell)	Characteristic	Characteristic
4	Consistency	Liquid	Solid

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Table 6: Showing Physicochemical parameter of Intermediate product

Sl. No.	Parameter	Vasa Kwath			Vasa swarasa		
		I	II	II	I	II	III
1	Total Solid Content	4.821	4.624	4.001	9.881	9.068	9.508
2	pH	6	6	6	7	7	7
3	Specific Gravity	0.582	0.540	0.261	1.035	1.035	1.025
4	Viscosity (millipoise)	9.35	9.41	9.38	9.73	9.87	9.79
5	Refractive Index	1.35	1.35	1.35	1.35	1.34	1.34

Table 7: Organoleptic characters of final products (Vasa Candy)

Sl. No.	Character	VC-1	VC-2	VC-3
1	Rasa (taste)	Tikta	Tikta	Tikta
2	Rupa (colour)	Black Brown	Brown	Brown
3	Gandha (smell)	Characteristic smell	Characteristic smell	Characteristic smell
4	Consistency	Solid	Solid	Solid

VC-Vasa candy

Table 8: Physicochemical parameter characters of final products (Vasa Candy)

Sl. No.	Physicochemical parameter	VC-1	VC-2	VC-3
1	Acid content (%)	0.105	0.110	0.107
2	Total reducing suger (%)	11.53	12.5	10.53
3	Loss on drying (%w/w)	1.5461	1.6543	1.5676
4	Sulphated Ash (%w/w)	0.6704	0.5762	0.7845

Then mass of content was vacuumed to make it free from moisture. Organoleptic, physico-chemical and qualitative parameters were carried out for authentication of raw material. In intermediate product, solid content in Vasa swarasa was observed more in comparison to Kwatha due to presence of water insoluble content.[17] Prepared Vasa candies have sweet flavor and bitter sweet taste. The sugar content in Vasa candy was found 90-98%, which may help in preserving the medicament for longer duration and also makes it palatable. The proportion of medicament varies when phase change i.e. in liquid form (0.5%), in semisolid form (1%) and solid form (2%). So that Vasa Kwatha converted into Ghana is effective as Bronchodilator, expectorant.[18] The physico-chemical parameter of Vasa candy showed acid content 0.105%, Total reducing sugar 11.53% sulphated 0.6704% w/w. Process flow chart helps to understand the idea of drug manufacturing at large scale and is also better than Vasa Avaleha for marketing purpose.[19]

The formulation composition of Vasa Avaleha has been converted in to Vatakas (Big circular mass) by trial and error. In cases honey was avoided to check the suitability and consistency of final product.

This formulation was also converted in to Lozenges. The results are encouraging for large scale production of Vasa candy. All the functional groups were present in both drugs i.e Vasa and Pippali except Saponins, which was absent in Pippali and present in Vasa.

CONCLUSION

At an average 4.5% of dried Ghana was obtained from average 7.94 liter of Vasa kwatha prepared in 1:8 ratio of Leaves and water respectively. The formulation composition of Vasa Avaleha has been converted in to Vataks without honey to avoid checking the suitability and consistency of final product. This formulation has also

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converted in to Lozenges. The results are encouraging for large scale production of Vasa candy. All the functional groups were present in both the drugs i.e Vasa and Pippali except Saponins. Total 1666 candies can be prepared from 5 kg wt of thick mass containing Vasa Ghana, Pippali powder, Sugar and glucose in the ratio 9.72:1:80:53.33 respectively with 3 g average weight of each candy. Vasa candy is more stable, palatable dosage form and can be administered at fixed unit dosage.

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