



# PHARMACEUTICAL MODIFICATION OF KUSHMANDAVALEHA INTO CANDY

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## ABSTRACT

Kushmandavaleha is a traditional Ayurvedic medicine used for respiratory, digestive disorders and one of the Medya Rasayana. As per Charaka samhita, Kalpa sthana “SWABUDHAIVA SAHASRANI KOTIRVAAPI PRAKALPAYET” here Acharya has given liberty to prepare different varieties of formulations with intellect of Vaidya. By keeping this view, pharmaceutical modification of Kushmandavaleha into candy was planned here. The Kushmandavaleha candy can be a convenient alternative for patients who have difficulty swallowing traditional medicine forms and can improve patient compliance. It can also be a more appealing form of the medicine for children and older adults. Idea behind this particular study was to give Ayurvedic medicines in the form of candy especially for children. As we know children are very much found of candies and Ayurvedic medicines are not palatable, so this type of modification will help to administer medicines easily to children. The study demonstrates the potential of modifying traditional Ayurvedic medicines into candy form to improve patient care especially paediatric age group.

**KEYWORDS:** Kushmandavaleha, Candy, Pharmaceutical Modification

## INTRODUCTION

*Panchvidha Kashya Kalpana* is the basic pharmaceutical preparations that are described in Ayurveda as fundamental principles. It has several drawbacks, such as less palatability, shorter shelf life, preparation difficulty on regular basis etc. Hence, to overcome these drawbacks, secondary formulations were developed to compete with the need of all-time availability, easy dispensing, and efficacy.<sup>1</sup> The secondary formulations include powders, tablets, suppositories, granules, lozenges, and so on that are prepared with the same herbal ingredients but differ in the quantity of ingredients, efficiency, dose, and adjuvant.<sup>2</sup> *Avaleha Kalpana* is one such secondary formulation developed by using primary formulations such as *Swaras* (juice), *Kwatha* (decoction), etc.<sup>3</sup> *Avaleha* formulation is prepared by using herbal medicinal drugs and food articles such as

sugar, ghee (clarified butter), and honey.<sup>4</sup>

Kushmandavaleha is widely used Ayurvedic medicine and is famous for its Medya karma. Apart from this it has got much therapeutic potential such as kasa, shwasa, chardi, raktapitta, bhrama, shosha, trishna, malabaddata<sup>5</sup>. Because of its palatability sometimes it is not possible to administer kushmandavaleha to children as well as sukumara purusha (sensitive person). Idea is to modify kushmandavaleha into candy form. With this there is an increase of its palatability, easy to carry, patient friendly. This project is planned by keeping children in view, as the children are very much found of candy; chocolates etc. in the form of candy, an Ayurvedic formulation will enter the mouth of the children.

### OBJECTIVES:

- To modify the form of Kushmandavaleha into Candy
- To prepare Kushmandavaleha
- To conduct analytical profile of prepared Kushmandavaleha and candy

### MATERIALS & METHODS

#### Materials:

Raw materials required for the preparation of Kushmanda avaleha were purchased from market. *Kushmanda* fruits were collected from a local vegetable market. The raw drugs were identified and authenticated.

Kushmandavaleha was prepared in Rasashastra lab of Ashwini Ayurvedic Medical College & PG Centre Davangere, Karnataka.

Candy was prepared in pharmaceuticals department of GMIT Davangere Karnataka.

#### METHODOLOGY:

#### Preparation of Kushmanda Avaleha<sup>6</sup>

Table No. 1: Ingredients with quantity

SL.NO.	INGREDIENTS	BOT.NAME	PART USED	QUANTITY
01	Kushmanda	<i>Benincasa hispida</i>	Fruit	7.5 kg
02	Dhanyaka	<i>Coriander sativa</i>	Fruit	24 g
03	Pippali	<i>Piper longum</i>	Fruit	48 g
04	Twak	<i>Cinnamomum zeylanica</i>	Bark	24 g
05	Ela	<i>Elettaria cardamomum</i>	Seed	24 g
06	Tejpatra	<i>Cinnamomum tamala</i>	Leaf	48 g
07	Maricha	<i>Piper nigrum</i>	Fruit	24 g
08	Shunthi	<i>Zingiber officinale</i>	Rhizome	48 g
09	Jeeraka	<i>Cuminum cyminum</i>	Fruit	48 g
10	Sharkara	Sugar	---	500 g
11	Go-ghrita	Ghee	---	192 g
12	Madhu	Honey	---	96 g

**Method of Preparation:**

The current formulation of Kushmandavaleha is taken from *Sharangdhar Samhita* and it contains a total of 12 ingredients.

The general process of preparation of Avaleha was followed for Kushmandavaleha. The SOP of Kushmandavaleha as follows:

- i) Preparation of powder (Prakshepa Dravya)
- ii) Preparation of Kushmanda pulp
- iii) Paka preparation
- iv) Preparation of Kushmandavaleha

**Preparation of powder (Prakshepa Dravya):**

All the ingredients from 2 to 9 were made into fine powder using pulveriser and sieves.

**Preparation of Kushmanda pulp:**

The collected fresh *Kushmanda* fruits were washed with water to remove the physical impurities present. They were cut into small pieces; the outer hard layer and the seeds of *Kushmanda* pieces were removed with the help of a knife, placed in a cooker containing double the quantity of water and steamed for 30 min. When it became cool, the contents were filtered and the softened pieces of *Kushmanda* were put in a stainless steel vessel. The pulp obtained was mashed into a soft mass and squeezed through a clean cloth to remove the water. Then, the pulp was fried in *Go-ghrita* (cow's ghee) on moderate fire till it turned to a brownish color and the ghee was separated.

**Paka preparation:**

Meanwhile the remaining part of water was put in separately for paka preparation. Sugarcandy in an equal quantity to that of paste was added to the squeezed water and heated on moderate fire till 1-2 thread consistency of sugar candy syrup was formed.

**Preparation of Kushmandavaleha:**

After confirming the 1-2 thread consistency of sugar candy syrup, fried kushmanda pulp and prakshepaka dravyas are added and stirred well. Take out from the fire and kept for swangasheeta. Then honey was added stirred well stored in airtight container.

**Observation:**

Colour: Brown

Taste: Sweetish

Odour: Characteristic smell of ingredients

Total quantity of prepared Kushmandavaleha 616g

## PREPARATION OF KUSHMANDAVALEHA CANDY<sup>7</sup>

Raw Materials:

Sugar – 80 g

Water – 100 ml

Kushmandavaleha – 10 g

**Procedure:** prepare 80% of sugar syrup by heating the mixture of 80 g of sugar with 100 ml of water at 110<sup>0</sup> C until the sugar dissolves and turns to a thick mass. Then 10g of Kushmandavaleha was added stirred well to form a thick mass then immediately poured to moulds (ghee smeared) to form candy, then kept in refrigerator. Then taken out from refrigerator prepared candies were wrapped in aluminium foil and kept in airtight container.

## ANALYTICAL STUDY

Prepared Kushmandavaleha and candy were subjected to analytical study and results were compared with API standards<sup>8</sup>. Parameters like organoleptic characters, physico-chemical analysis, microbial load were tested for both samples in AYUSH approved laboratory.

## RESULTS

**Table No. 2: ORGANOLEPTIC CHARACTERS OF KUSHMANDAVALEHA**

SL.NO.	TESTS	RESULT
01	Form	Semi-solid
02	Taste	Sweet
03	Odour	Non-specific
04	Colour	Brown

**Table No. 3: PHYSICO-CHEMICAL STANDARDS OF KUSHMANDAVALEHA**

SL.NO.	TESTS	RESULT
01	Loss on drying	3.545%
02	Ash value	2.034%
03	Acid insoluble ash	0.0904%
04	Water soluble extractives	58.196%
05	Alcohol soluble extractives	26.459%
06	pH value	4.72
07	Reducing sugar	46.480%

**Table No. 4: TEST FOR SPECIFIED MICRO-ORGANISMS (QUALITATIVE) OF KUSHMANDAVALEHA**

SL.NO.	MICRO-ORGANISMS	LIMIT AS PER IP	RESULT
01	E-coli	Absent/100ml	Absent
02	S. aureus	Absent/100ml	Absent
03	P aeruginosa	Absent/100ml	Absent
04	S abony	Absent/100ml	Absent

**Table No. 5: MICROBIAL LIMIT TEST (QUANTITATIVE) OF KUSHMANDAVALEHA**

SL.NO.	Test	LIMIT AS PER IP	RESULT
01	Total bacterial count	30 - 300 cfu/ml	TNTC
02	Total fungal count	10 -100 cfu/ml	10 cfu/ml

**Table No. 6: ORGANOLEPTIC CHARACTERS OF KUSHMANDAVALEHA CANDY**

SL.NO.	TESTS	RESULT
01	Form	Solid (candy)
02	Taste	Sweet
03	Odour	Non-specific Pleasant
04	Colour	Brown

**Table No. 7: PHYSICO-CHEMICAL STANDARDS OF KUSHMANDAVALEHA CANDY**

SL.NO.	TESTS	RESULT
01	Loss on drying	4.770%
02	Ash value	0.868%
03	Acid insoluble ash	0.192%

**Table No. 8: TEST FOR SPECIFIED MICRO-ORGANISMS (QUALITATIVE) OF KUSHAMNDAVALEHA CANDY**

SL.NO.	MICRO-ORGANISMS	LIMIT AS PER IP	RESULT
01	E-coli	Absent/100ml	Absent
02	S. aureus	Absent/100ml	Absent
03	P aeruginosa	Absent/100ml	Absent
04	S abony	Absent/100ml	Absent

**Table No. 9: MICROBIAL LIMIT TEST (QUANTITATIVE) OF KUSHAMNDAVALEHA CANDY**

SL.NO.	Test	LIMIT AS PER IP	RESULT
01	Total bacterial count	30 - 300 cfu/ml	TNTC
02	Total fungal count	10 -100 cfu/ml	6 cfu/ml

## DISCUSSION

Avaleha kalpana is easy to prepare, if the person is expert in analyzing the paka lakshana. All the avaleha siddhi lakshana explained in classics have been tested to approve the final product. Siddhi lakshanas like supakwa refers to proper paka of kushmanda fruit pulp after frying in ghee. Tantumatvam refers to tantupaka, prepared sugar syrup should be of 1-2 thread consistency. Apsumajjati refers to, prepared avaleha sinks in water, should not spread in water. Gandhavarna rasodhbhava refers to, prepared avaleha should bear characteristic smell, colour and taste of ingredients.

As Kushmnada is full of jala mahabhuta pradhana dravya, 90% loss was observed at the time of fruit pulp collection. Water soluble extractives were found to be more when compared to alcohol soluble extractives. Microbial load was observed within limit. Prepared avaleha is again mixed with sugar syrup and with the help of different shapes of moulds candies were prepared. Taste of the prepared candies found to be good.

## CONCLUSION

We can consider Kushmandavaleha as one of the example for Nutraceuticals. As the main ingredient Kushmanda is a vegetable which is used routinely in our kitchen to prepare many food articles. As Kushmandavaleha is said to be Medya rasayana, it will be beneficial for growing children. Administration of Avaleha is not feasible when compared to candy. Same formula modified into candy results in easy administration. On observation in both Kushmandavaleha and candy, demand for candy is more by the children. All analytical parameters of both samples were within normal limit as per API standards.

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### PHOTOS

