

PHARMACEUTICO-ANALYTICAL STUDY OF KUSHMANDADIGRANULES – A NEW DOSAGE FORM

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ABSTRACT

The concept of *Smriti* has been discussed in various *Ayurvedic* texts in wider aspects. *Smriti* is discussed as one among *Ashta Aishwarya*. *Acharya Chakrapani* explains *Smriti* as a component of *Buddhi* & relation with *Atma*, *Manas*. The *Ayurvedic* classics identified the importance of higher faculties dealing with memory and introduced a separate group of drugs namely *Medhya Rasayanas*. *Kushmanda* & *Brahmi* both are well known *Ayurvedic* herbs for their actions on the central nervous system, especially to enhance intellect, memory, and other mental faculties. **Materials and methods:** Granules preparation was carried out as per the general method of preparation. **Result:** physio chemical analysis of the present study shows pH of 7.54, 7.23, 6.57. Loss on drying(%) 20.2, 12, 3.6. Total Ash (%)0.42, 0.58, 1.34. Total fat 3.4%, 3.9%, 4.1%. respectively for three batches of *Kushmandadi* Granules.

Keywords: *Smriti*, *Buddhi*, *Manas*, *Medhya Rasayana*, Memory, *Kushmanda*, *Brahmi*.

INTRODUCTION

Mental health is a state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn well and work well, and contribute to their community ^[1]. In the present era, Mental health plays an important role in the physiology of human beings. Globally, 1 in every 8 people in the world lives with a mental disorder ^[2]. Approximately 15% of adults suffer from mental ill health ^[3]

The prevalence of attention-deficit hyperactivity disorder (ADHD) among children of age group 11-17 years was 2.1%. and the syndrome was 1.7-17.8% in India.^[4] Where this has a relation with short-term memory.

Hence, it is important to deal with mental health disorders, which result from a negative effect on physical health as well as the memory of an individual. To overcome these scenario specific treatment modalities that are mentioned in *Ayurveda* can be followed.

As mentioned in our classics, The word *Medha* is explained in a broad way. It includes three mental faculties- *Dhee*, *Dhruthi*, and *Smriti* ^[5] And all these are interconnected with each other. *Medhya rasayanas* are a group of medicinal plants that specifically helps in enhancing *Grahana Shakti*, *Dharana shakti*, *Viveka shakti*, and *Smriti*. (memory/ intellect) and also the quality of life. These drugs enhance *Satva guna* as well as balance *Rajas and Tamo guna*.

The current study deals with the formulating granules owing to the priority over the other dosage forms.

The present study is an attempt to evaluate the physiochemical analysis of the formulation of *Kushmandadi* granules.

AIMS & OBJECTIVES

1. To prepare *Kushmandadi* Granules.
2. To carry out the physiochemical analysis of *Kushmandadi* Granules.

MATERIALS & METHODS

Study design: pharmaceutico- analytical study

The pharmaceutical study includes the stepwise preparation of *Kushmandadi* Granules according to the batches and mentioned ratios. The analytical study includes the physiochemical analysis of the formulation.

Raw drug identification and collection :

The raw drugs required for the preparation of *Kushmandadi* Granules were obtained from Alva s pharmacy and *Kushmanda* is collected from the local available market. after proper authentication from the Dept. of *Dravyaguna Vijnana*, Alva's ayurveda medical College Moodubidire. The preparation of the *Kushmandadi* granules was done at *Rasa Shastra and Bhaishajya Kalpana* Departmental laboratory, Alva's Ayurveda Medical College., Moodubidire, Karnataka. And Analysis of formulation carried out at the research Lab at ATMA Research centre, Alva's Ayurveda Medical College., Moodubidire, Karnataka.

Sl.NO	Name of the ingredients	Botanical name	Family	Part used	FORM
1.	<i>Kushmanda</i>	<i>Benincasa hispida</i> (Thunb)Cogn	<i>Cucurbitaceae</i>	Fruits and seeds	Fresh fruit
2.	<i>Brahmi</i>	<i>Baccopa monneri</i>	<i>Scrophulariaceae</i>	The whole plant, leaves	Dry plant
3.	<i>Ela</i>	<i>Elettaria cardamomm</i>	<i>Zingiberaceae</i>	Fruits and seeds	Fine powder
4.	<i>Patra</i>	<i>Cinnamomum tamala</i> Nees and Ebern	<i>Lauraceae</i>	Leaves	Fine powder
5.	<i>Twak</i>	<i>Cinnamomum zeylanica</i> Blume	<i>Lauraceae</i>	Stem bark	Fine powder
6.	<i>Sunthi</i>	<i>Zingiber officinale</i> Roscoe.	<i>Zingiberaceae</i>	Rhizome	Fine powder
7.	<i>Khanda sharkara</i>	<i>Saccharum officinarum</i>	<i>Poaceae</i>	Stem	Course one

Table no.1 : Formulation composition of *Kushmandadi* granules.

Method of preparation :

- ❖ All the ingredients are taken in a specified quantity as mentioned above in all three batches.
- ❖ *Kushmanda* was made in to half then it's outer part is peeled off and *Swarasa* was extracted from the juice.
- ❖ *Brahmi* is taken in a SS vessel was taken 4 parts of water are added and reduced then it is filtered through kora cloth.
- ❖ Then these are taken in a SS vessel heating is continued. Followed by the addition of *Khanda sharkara*.

- ❖ A specified quantity of powdered *Khanda Sharkara* was added to the filtrate and boiled over Mild fire with continuous stirring until the mixture attained thread consistency of '*Avaleha Paka*', further till attainment of 2-3 thread consistency
- ❖ Then the flame was turned off and then the *Prakshepaka Dravyas* (S.No. 3-6) were added and Mixed thoroughly, allowed to self-cool.
- ❖ The obtained product is collected and stored in air tight container.

ANALYTICAL STUDY :

SL.NO	PARAMETERS	OBSERVATION		
		BATCH 1	BATCH 2	BATCH 3
1.	Loss on drying at 105 ⁰ C	12	20.2	3.6
2.	Total ash (%)	0.58	0.40	1.34
3.	Total fat (%)	3.9	3.4	4.1
4.	pH	7.23	7.54	6.57

SL.NO	Tap density	Bulk density	Flow property	Compressibility
1.	59%	78%	88%	86%
2.	48%	69%	86%	79%
3.	26%	53%	92%	57%

Table no 2&3: physio chemical analysis of *Kushmandadi Granules*

DISCUSSION

The present study is an attempt to formulate *Kushmandadi Granules*' preparation. Comprising ingredients *Kushmanda*, and *Brahmi* as major ingredients having *Medhya Rasayana*, *Balya*, *Bruhmana*, action with *Twak*, *Ela*, *Patra*, and *Sunthi* as *Prakshepaka dravyas*. *Kushmanda* is one of the main ingredients in the formulation, as per available scientific data *kushmanda* is used as food and potent medicine. It acts as *Pittapaha* in *Bala Avastha*, *Kaphakaraka* in *Madhyama Avastha*, *Basthi suddhikara*, *Chetoroga hrit* at *Vruddha Avastha*.^[6] Pharmacological actions like nutritive, tonic, diuretic, and mainly intellect promoter. The biologically active chemical components^[7]include an alkaloid called cucurbitine, flavo-

noids, mannitol, resin, protieds, myosin, vitellin, sugar, and fixed oil.

Brahmi is a well-known nootropic plant reported for its *Medhya* action (brain tonic). It has *Rasayana*, *Swarya*, *Smriti vardhaka*, *Ayusyakara*, and *Hrudya* actions. Biologically active chemical components include D- mannitol, stigmastreol, bacoside A&B, monnierin, betulinic acid, g- sitosterol, and mannitol. Studies have indicated anticonvulsant^[8] nervine tonic, sedative action^[9], cognitive enhancer^[10], hepatoprotective^[10], memory enhancer^[11], and antioxidant actions^[12-14] Neuroprotective activity may be ascribed to having reactive oxygen species scavenging property (ROS)^[15]. *Baccopa monniera* is a saponin-rich plant^[16] Bacosides are the main active nootropic principle present in the alcohol extract of the plant^[17] *Twak*, *Ela*, *Patra* & *Sunthi* are the *Prakshepa dravyas* used in the formulation. The preservative action Of

the *Prakshepa dravyas* like *Twak*, *Patra*, *Ela*, etc due to their anti-microbial property which can be appreciated in the formulation. *Prakshepa dravyas* contribute acceptable odour, colour, and taste for the product. The pharmaceutical part of the study includes the stepwise preparation of the product, where the observations and the findings were noted from the commencement till the attainment of the final product. During the preparation of the *Kushmandadi* granules, at first, *kushmanda* was cut into half, the outer peel is scraped then *swarasa* was extracted from the fruit. On the other hand *Brahmi* whole plant was weighed and soaked overnight. *Kashaya* was prepared by adding 4 parts of water and reduced to a quarter in 1&2 batches. In the 3rd batch, it was reduced to 1/8 th proportion. Mild to moderate flame was maintained throughout the process to attain granular consistency. The total duration taken for preparation of decoction was 2 hr 40 min on average. Sugar candy was added in the prescribed quantity in powdered form to the prepared decoction to facilitate easy dissolution and attainment of granular consistency of the final product. The assessment of *Paka Lakshanas* in the case of granules preparation was 2-3 thread consistency of the sugar syrup content which indicates less moisture content in the mixture. When little quantity of *Paka* material was dropped into a bowl containing water it did not spread. The total duration taken for granules preparation was 1 hr 20 min on average. The final product of *Kushmandadi* granules was 440g, 350g, and 690 g respectively. *Kushmandadi* Granules are brownish in colour possessing characteristic odour and taste. Basic physical analysis was carried out for the granules and results are depicted in Table No2&3.

LOSS ON DRYING

The moisture content of samples 1,2&3 was found 20.2%,12% &3.6%. It indicates low moisture content and is desirable for higher stability of both formulations.

TOTAL ASH

Ash Value of Samples 1,2&3 was found 0.42%,0.58%, and 1.34% respectively. This value was found to be reasonably low, which indicates low contamination. It is the criteria for identifying the purity

of the drugs. Total ash is inclusive of extraneous matter such as sand, soil, etc adhering to the herbal drug.

pH

pH of samples of batches was 7.54, 7.23& 6.57. Respectively, which is alkaline or basic. This indicates granules may not cause harm to the gastric Mucosa and increase the integrity of gastric mucosa.

TOTAL FAT

The fat content of samples was found to be 3.4%, 3.9%, and 4.1% respectively.

CONCLUSION

- ❖ *Kushmanda* botanically identified as *Benincasa hispida* (Thunb) Cogn. And *Brahmi* as *Baccopa monneri*. These drugs have multi-fold benefits, specifically to improve memory (*Medhya*) and intellect by their *Prabhava*.
- ❖ Phytochemical analysis revealed the presence of alkaloids, cucurbitine, flavonoids, mannitol, stigmasterol, bacoside A&B, monnierin, betulinic acid, g- sitosterol,
- ❖ The pharmaceutical profile of formulation can guide further updation of the dosage form. The analytical profile of formulation serves as the base for setting the quality profile of formulation.

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PHOTOS SHOWING THE PREPARATION OF KUSHMANDADI GRANULES:

INGREDIENTS OF KUSHMANDADI GRANULES



KUSHMANDA FRUIT



KUSHMANDA SWARASA



BRAHMI DRY DRUG



BOILING OF KASHAYA



FILTERED KASHAYA



ADDING BOTH IN THE VESSEL



<p>ADDING KHANDASHARKARA</p> 	<p>CONSTANT STIRRING</p> 
<p>ATTAINMENT OF 2-3 THREAD CONSISTENCY</p> 	<p>ADDING PRAKSHEPAKA DRAVYAS</p> 
<p>HOMOGENEOUS MIXTURE</p> 	<p>KUSHMANDADI GRANULES</p> 
<p>FINISHED PRODUCT</p> 	