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A PHARMACEUTICO ANALYTICAL STUDY OF AMRUTAKALAANIDHI VATI

Dr Gopikrishna K S [1*], Dr Santosh S Kulkarni [2], Dr Shashidhar Jeeru[3]

3rd Year P.G Scholar[1], Professor and H.O.D[2], Professor[3]

Dept of Rasashastra & Bhaishajya Kalpana, Shree Jagatguru Gavisiddeshwara Ayurvedic Medical College and Research center, Koppal.

[*]***Corresponding Author***

ABSTRACT

Ayurveda the natural healing system guides us the use of different kinds of herbal, mineral and animal origin drugs. The quality control and assurance are most essential factor in today's practice. Hence the present study has been taken to analyze Amrutakalaanidhi Vati (AKN Vati) as per Ayurveda classics and modern parameters like physicochemical tests, XRD, SEM EDAX. ***AIMS AND OBJECTIVES:*** *To do Pharmaceutico-Analytical study of AKN Vati.* ***Materials and Methods:*** *Preparation of AKN vati and physic-chemical analysis of AKN vati and Varatika at different stages.* ***RESULTS:*** *Preparation yielded a good quality of vati and the overall methods adopted were not too tedious. XRD showed change in crystallinity of calcium compound and SEM-EDX showed calcium and silica as major elements in VB and AKN Vati.* ***Discussion and Conclusion:*** *AKN vati indicated in Jwara and Agnimandya. To gain acceptance of the medicine at the global level present study focused on pharmaceutical and analytical aspects.*

KEYWORDS: *Amrutakalaanidhi Vati, Vatsanabha, SEM-EDX, Jwara.*

INTRODUCTION

Rasashastra and Bhaishajya Kalpana is a branch of Ayurveda which has many tailor-made medicines for acute conditions like Jwara, Kasa, Swasa etc. these herbo-mineral preparations have quick action, require small doses and are easy to administer. Amrutakalaanidhi vati[1,2] is one such preparation described in the text Bruhat Nighantu Ratnakaraand later quoted in the text Bharata Bhaishajya Ratnakara and Bhavaprakasha which is indicated in Jwara and Ajeerna. Jwara is an acute condition that can be co-related to fever and has the highest prevalence rate of 75% as a major or minor complaint. Jwara when improperly or incompletely treated facilitates the deeper penetration of vitiated doshas giving rise to new diseases and also causes mandagni at the dhatu levels[3]. One major obstacle for a Vaidya to practice Ayurveda is the non-availability of most of the classically explained medicines; AKN vati is one such example. Though the formulation is easy to prepare and can be administered clinically, it is not readily available on the market. To propagate its use one has to prove its safety and efficacy. The above situation can be addressed by standardizing pharmaceutical procedures and accessing the raw materials, intermediate products and final products using different analytical techniques like XRD, SEM-EDX etc.

MATERIALS AND METHODS

Pharmaceutical steps adopted in preparation of AKN Vati

- Shodhana of Varatika - Swedana in dolayantra using nimbu rasa as drava dravya for one yama[4].
- Marana – total 3 ardha-gajaputa was given and Vartika Bhasma was prepared[5].
- Shodhana of Vatsanabha was carried out by Go mutra sthapana method for 3 days[6].
- Choornikarana of Shodhita Vatsanabha and Maricha.
- Amruthakalanidhi vati was prepared by mixing 2 parts of S.Vatsanabha, 5 parts of Varatika Bhasma and 9 parts of Maricha choorna and by giving bhavana with jala (Distilled water)
- Packing and labelling

Table showing the quantitative changes in the processing of Varatika

SAMPLE	BEFORE	MEDIA	AFTER	LOSS/GAIN
VARATIKA	250 grams	(Initial quantity taken)		
SHODHA NA	230 grams	2 ltr of Nimbu rasa	224 grams	(- 6) grams
1ST PUTA	204 grams	NA	200 grams	(- 4) grams
2ND PUTA	180 grams	90 grams of Kumari	175 grams	(-5) grams
3RD PUTA	140 grams	75 grams of Kumari	140 grams	No change

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- After every step of processing the Varatika an average of 20 grams of the sample was collected for Analytical study.
- There was a loss of 6% of Varatika from all the steps of processing.

Table showing the quantitative changes in the processing of Maricha and Vatsanabha

Drug	Wt. of Raw drug	Wt. after churnikarana	Loss	Yield
Maricha	1000 grams	850 grams	150 grams	85%
Vatsanabha	1000 grams	600 grams	400 grams	55%

- It was quite difficult to obtain fine powder of Maricha when compared to that of Vatsanabha as the Maricha is more fibrous.
- Excluding the fine powder there was another 100 grams of course powder of Maricha remained after processing.
- Nearly 45% of loss is seen in the processing of Vatsanabha. It is mainly because of two reasons i.e. due to worm's infestation and loss due to the removal of outer covering.

Table showing the processing of Amrutakalaanidhi Vati

Ingredients	Measurement
S.Vatsanabha	20 grams
S.Varatika bhasma	50 grams
Maricha	90 grams
Distilled Water (Bhavana dravya)	160 ml
Weight of the end product	**180 grams**
Yield	**112.5 %**

- After bhavana the quantity of the mixture was raised from 160 grams to 215 grams, later on drying the weight was reduced to 180 grams resulting in the total gain of 20 grams.

RESULTS OF ANALYTICAL STUDY

a. Organoleptic characters of Varatika Bhasma and AKN vati

Test	Varatika Bhasma	Amrutakaanidhi vati
Sparsha	Mrudutva, Sookshma	Mrudutva
Varna	Shwetha varna	Kapisha varna
Rasa	Kshareeya	Katu
Gandha	Odourless	Go mutravat

b. Analytical results of AKN Vati and Varatika Bhasma

Drug	Varatika Bhasma	AKN Vati
pH value	8.81	8.57
Loss on drying	1.3 %	6.9 %
Total Ash value	106.4 %	33.5 %
Water soluble ash	13.5 %	5.4 %
Acid insoluble ash	99.4 %	28.7 %

c. Results of Tablet Analysis of Amrutakalaanidhi vati

Friability - 2.816
Disintegration - 15 mins
Hardness test – Not suitable to perform
Uniform weight – 65 mg +/- 5 mg

d. **Compiled SEM-EDX results of all the 4 samples**

Elements Found	Concentration in %			
	Ashuddha varatika	Shodhita varatika	Varatika bhasma	AKN vati
Ca(Wollastonite)	37.75	29.83	34.51	1.11
SiO2	50.10	55.30	52.61	44.89
CaCO3	10.89	14.27	12.88	48.93
Magnesium	0.21	-	-	0.52
Chlorine	-	-	-	0.36
Potassium	-	-	-	3.63
Sodium	0.49	0.60	-	-

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Silica	0.31	-	-	-
Iron (Fe)	0.25	-	-	-
Zinc (ZnK)	-	-	-	0.56

e. **Compiled XRD results of all the 4 samples**

COMPOUND NAME	C.F	CRYSTAL STRUTURE		
		ASHUDDHA VARATIKA	VARATIKA BHASMA	AKN VATI
Wollastonite	$CaSiO_3$	Triclinical	Triclinical, , more crystalline	-
Silicate	SiO_2	Tetrahedral	Tetrahedral	Tetrahedral
Calcium carbonate	$CaCO_3$	Hexagonal	Trigonal, more crystalline	Trigonal, more crystalline
Potassium chloride	KCl	-	-	Cubic

PROBABLE MODE OF ACTION - Vatsanabha is a well-known swedana janaka • Varatika does pitta samana due to its rooksha guna which reduces the drava roopi pitta. • On the other hand maricha having katu rasa, ushna virya, deepana and pitta kara properties helps to increase the karya roopi pitta. • Shodhana dravya will also influence the therapeutic values of a drug, in this study Gomutra used for purifying vatsanabha have kapha, visha and krimi hara properties114 which helps in tackling Jwara. • Varatika shodhana is carried out by using Nimbu swaras which helps to overcome agnimandya and cures shoola, kills krimi and ruchikara. • Kumari swarasa used in bhavana of Varatika is of sheetha virya and pachana properties which are very much essential in cases of pittaja jwara. • Kumari has some traces of calcium and other minerals which has therapeutic importance and kumara is yakrut utejaka.
Maricha as prati-visha of vatsanabha – In Kriya koumudhi maricha kashaya is indicated in toxicity of vatsanabha and in Yogaratnakara, to neutralize the toxic effects of vatsanabha one part of Tankana and two parts of maricha is advised.

Akn word derivation - Amrutha word refers to Vatsanabha, The word Kala in relation to numbers denote the total number of kala's i.e Shodhasha kala, here it is used to denote the total number of parts of medicine quoted in the shloka i.e 16 and the word Nidhi used in the medicine name denotes Varatika according to Shabdhakalpadruma, which says Varatika is called Nidhi as it is obtained during Samudra mathana.

DISCUSSION AND CONCLUSION

Pharmaceutical study: AKN vati preparation yielded a good quality of vati and the overall methods adopted were not too tedious and effective.

Analytical Study

Uniformity of weight - All 20 handmade tablets of AKN Vati were within the limit 65±5 mg of the average weight. This test indicates the uniform dose distribution.

Disintegration test - The test is performed to find out that within how much time the tablet disintegrates. The disintegration affects the rate of absorption of drugs. The results obtained are within normal time period i.e., 15 mins.

Hardness test - It indicates the hardness the of the tablets, if the tablet is too hard, it may not disintegrate in required period of time and if the tablet is too soft it may not withstand the handling during packing and transporting, as AKN vati showed negligible amount of hardness care is to be taken while transportation. Friability test - It is performed to evaluate the ability of the tablets to withstand abrasion in packing, handling and transporting. The results obtained was 2.816 % whereas the normal range should be less than 1%. Both hardness and friability are less than the normal level suggesting the tablets are soft and can be broken easily, this is because the pills are handmade, very small in size and for bhavana dravya jala was used which does not help the particles to bind more compactly.

XRD - reports showcased the importance of pharmaceutical procedures explained in Ayurveda, as it showed the conversion of less absorbable form of Calcium into more acceptable form. The increase in crystalline nature (sharper peaks in XRD denote more crystalinity of the sample) of the drug by Marana was proved by the XRD reports.

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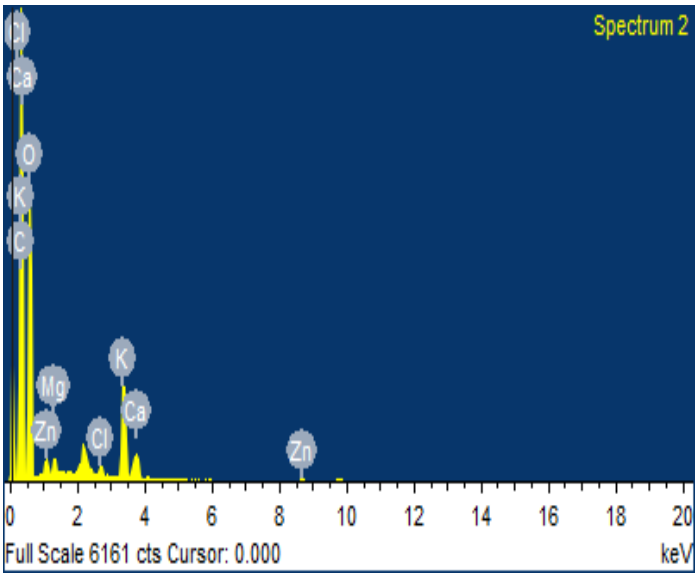
SEM-EDEX - Elements present in the samples were confirmed by SEM-EDX study and significant change in the form of Calcium present in Varatika after Bhavana showed the importance of samyak bhavana and hinted the possibility of chemical reactions taking place between herbal and mineral substances during Bhavana.

REFERENCES

1. *Anonymous – Bruhat Nigantu Ratnakara vol 4, Hindi Teekakar Shree Dhattarama Shree Krishna Lal Mathur, Khemaraaja Shree Krishna Das Prakashan, Bombay – 2004. Pg.no. 1490/78.*
2. *Bhavamishra – Bhavaprakasha vol 2, Vidyotini hindi commentary, 1st edition, Varanasi–2013, Chaukhamba Sanskrit Bhavan, Jwaraadhikara, 597th shloka.pg-122*
3. *Acharya Caraka – Caraka Samhitha Vol 2 , English Editor- Translator Dr P V Sharma ,Choukamba Orientalia , Varanasi – 1998. Chikitsasthana 3rdcapter, 335st shloka.*
4. *Sadananda Sharma, Rasa Tarangini, edited by Kashinath Shastry, New Delhi,Motilal Banarasidas Publication, 2000, 12th chapter, verse-90 Pp-300.*
5. *Sri Madhavacharya, Edited by Shri Gulrajsharma Mishra, Ayurved-Prakasha, Varanasi, Chukamba Bharati Academy, 2007, 2nd chapter, shloka-300, Pp-331.*
6. *Shastri Kashinath. (2014). Rasa Tarangini of Sadanada sharma. 8 th Ed. Chapter 24: Vishaoupavisha vijinaniya, verse 19-25. Delhi: Motilal Banrisidas; p. 651-2.*

Bhavana of AKN Vati

Amruthakalanidhi Vati



SEM-EDEX report of AKN Vati

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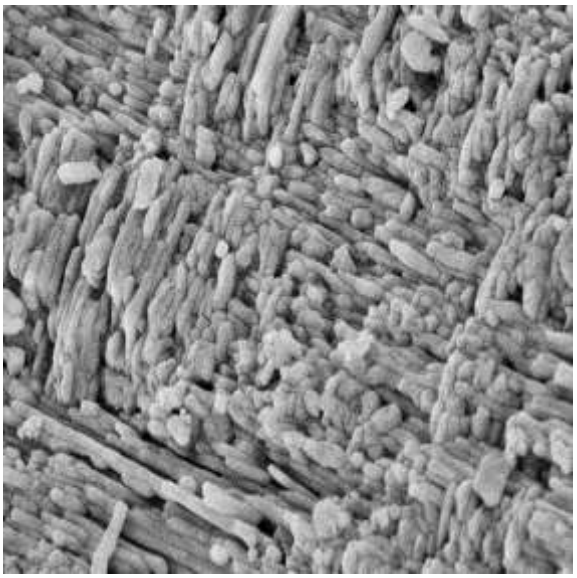
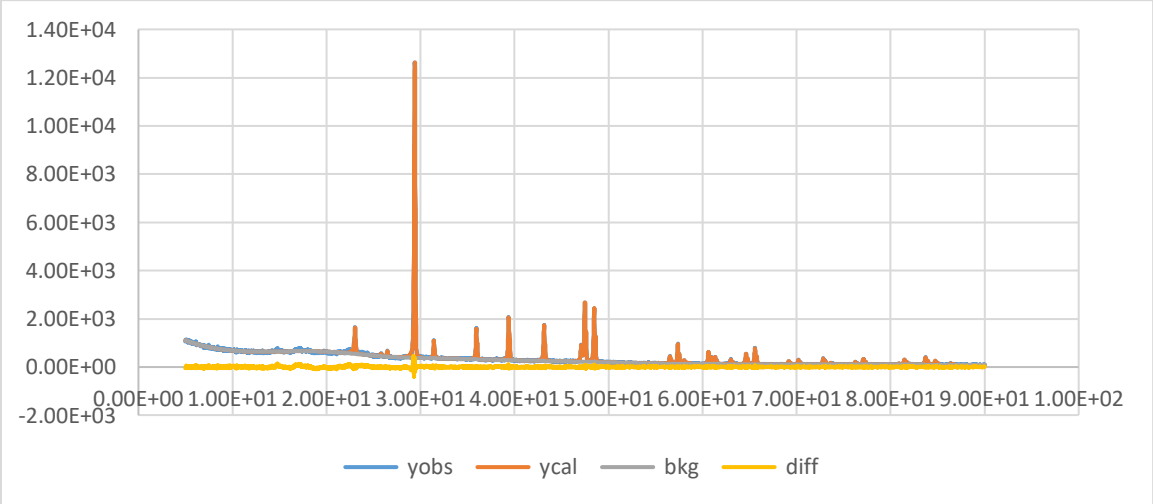


SEM-EDEX report of AKN Vati



XRD report of AKN vati