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PHARMACEUTICO ANALYTICAL STUDY OF *KUSHMANDA KSHARA*- A CLASSICAL FORMULATION

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ABSTRACT

Ayurveda describes various dosage forms. One such dosage form is *Kshara Kalpana*. *Kshara* are the substances obtained from the ashes of the drugs of animals, minerals and plants origin where alkaline portion is extracted from the ashes of these substances are even proved to be effective in treating various disorders. *Kshara* is the substances which has *Ksharana* property. This study aims to highlight the pharmaceutical aspect of *Kushmanda Kshara* according to the *Bruhat Niganthu Rathnakara*. *Kushmanda Kshara* is mainly indicated in various *Shoola, where* it is explained under the context of *Amashoola*. *Kushmanda Kshara* is mixed with *Shunti Choorna* which causes *Amapacahana* and reduces the *Shoola* and to perform the physico - chemical analysis of *Kushmanda Kshara*. *Pakwa Kushmanda* (*Benincasa hispida* (Thunb.) Cogn.) was collected and authentication was done by the experts. *Kushmanda Kshara* was prepared as proposed in the text of *Bruhat Niganthu Rathnakara*. Physcio Chemical analysis was carried out according to Standards. p^H showed higher alkaline nature (10.5). This study highlights about the pharmaceutical preparation, practical difficulties during the preparation, final yield, probable causes for loss of final product, precautions followed during procedure of *Kushmanda Kshara***.** The preliminary physico- chemical analysis suggested the genuine values of product, that the total ash is 38.8 w/w%, acid insoluble ash is 6.9 w/w%, p^H is 10.5, water soluble extract is 11.5 w/w%, alcohol soluble ash is 13.6 w/w%.

KEYWORDS: *Kushmanda Kshara, Paneeya Kshara*, *Mridu Kshara,* pharmaceutical study, analytical study, *Benincasa hispida* (Thunb.) Cogn.

INTRODUCTION

Kshara is a substance which causes *Ksharana* mainly to *Mamsa* and other *Dhatus*. *Kshara* is an alkaline preparation obtained from ash of dried plants, minerals and also from animal source. *Ksharas* are of 2 types -*Paneeya Kshara* and *Pratisaraneeya Kshara*. *Dalhana* explains that *Paneeya Kshara* can be used in the form of *Ksharodaka* or it can be used in other forms like *Choorna, Vataka, Avalehas*. *Acharya Sushruta* indicated *Paneeya Kshara* in *Agnisanga, Ajeerna, Arocaka, Anaha, Asmari, Sharkara, Krimi, Abhyantara Vidradhi, Arsas and Jwara.*

Kushmanda is a best medicinal fruit-yielding creeper used in classics since ancient times to treat varieties of disorders. *Kushmanda* is a common vegetable in Indian community which is well known for both nutritional and medicinal properties. *Kushmanda Kshara* is a classical Ayurvedic formulation mentioned in *Bruhat Nigantu Rathnakara*[1], under *Shoola Chikitsa* where the *Kushmanda* pulp is used to prepare *Kshara* by using closed method of heating. *Kushmanda Kshara* is indicated in *Amashoola*[2] with *Shunti Choorna.*

AIM

The study aimed to perform the practical preparation of *Kushmanda Kshara.* according to the *Bruhat Niganthu Rathnakara.*

OBJECTIVES

The present study was carried out with following objectives

1. To study the pharmaceutical aspect of *Kushmanda Kshara* according to the *Bruhat Niganthu Rathnakara.*
2. To evaluate the organoleptic characters of *Kushmanda Kshara.*
3. To perform the physico -chemical analysis of *Kushmanda Kshara.*

MATERIALS AND METHODS

Table 1: Formulation composition of *Kushmanda Kshara.*

Sl.No	Ingredient	Botanical Name	Part used	Quantity taken
1	*Pakwa Kushmanda*	*Benincasa hispida* (Thunb.) Cogn.	Fruit	1.680Kg

Pakwa Kushmanda was procured from the market and authenticated by the Rasashastra and Bhaishajya Kalpana department experts, Alvas Ayurveda Medical College, Moodubidire, Dakshina Kannada, Karnataka. The pharmaceutical study was done in the Department of Rasashastra and Bhaishajya Kalpana, Alva's Ayurveda Medical College, Moodubidire, Dakshina Kannada, Karnataka.

Table 2: Properties of *Pakwa Kushmanda.*

SL.No	***Rasa* - *panchaka***	***Bhavaprakasha Niganthu*[3]**	***Kaiyadeva Niganthu*[4]**	***Niganthu Adarsha*[5]**
1	*Rasa*	*Madhura, Kshara*	*Madhura, Kshara*	*Madhura*
2	*Guna*	*Laghu (Vriddha)*	*Guru, Ruksha, Laghu, Ushna*	*Laghu, Ushna*
3	*Virya*	*Kinchith Sheeta*	*Sheeta Ushna*	*Sheeta*
4	*Vipaka*	-	*Madhura*	*Madhura*
5	*Dosha Karma*	*Tridoshahara*	*Tridoshahara*	*Tridoshahara*

Equipment used

Tula Yantra, Khalwa Yantra, Sharava, Mud pot, Gas stove, Spoon, Steel vessels, Steel plates.

METHOD OF PREPARATION

Purva Karma

Procedure: *Pakwa Kushmanda Phala* was washed with the water. Outer part was peeled and inner seeds were removed. The pulp of *Pakwa Kushmanda* were taken and made into pieces. These pieces of Pakwa *Kushmanda* were allowed to dry for 15 days.

Pradhana Karma

Method adopted

Closed method of heating

Procedure

An earthen pot was selected and dried *Pakwa Kushmanda* pieces were added and earthen pot was closed by using *Sharava.* Sufficient amount of heat was applied, until the pieces of *Pakwa Kushmanda* inside the earthen pot completely turns into black color. The final product was kept for self-cooling.

Paschat Karma

Procedure

After self-cooling, the prepared formulation was pounded into very fine consistency by using *Khalwa Yantra.* Later the final product was stored in airtight glass container.

OBSERVATIONS AND RESULTS

Table 3: Observations recorded during the processing of *Kushmanda Phala.*

Sl.No	Observational criteria	Quantity (Kg)
1	Quantity of *Pakwa Kushmanda Phala* taken	1.68
2	Quantity of Pakwa *Kushmanda Phala* obtained after removal of outer peel	1.54
3	Quantity of *Pakwa Kushmanda Phala* obtained after removal of seeds	1.45
4	Quantity of *Pakwa Kushmanda Phala* obtained after slicing	1.23

Table 4: Observation on the weight of *Kushmanda* during drying.

Sl.No	Observations	Quantity
1	Quantity of *Pakwa Kushmanda Phala* before drying	1.20Kg
2	Quantity of *Pakwa Kushmanda Phala* after drying	200g

Table 5: Chart explaining the time and observation during the preparation.

Time	Observation
9.45am	Dried pieces of *Kushmanda* are kept in mud pot by closing the mouth of mud pot by *Sharava*
9.50am	Heat was given
10.10am	Pieces of *Kushmanda* turned out into flakes
10.30am	Flakes appeared golden yellow color
10.34am	Fumes started to appeared
10.50am	Flakes turned into brown color
10.55am	Stove kept on
11.10am	Flakes turned to black colour
11.15am	Fumes continue to appear
11.30am	Slices turned to jet black
11.35am	Fumes continue to appear
11.57am	Fumes subsided completely
11.58am	Stove kept off

Table 6: Final results of *Kushmanda Kshara.*

Particulars	Results
Initial weight of *Kushmanda* after drying	200g
Weight of *Kushmanda Kshara*	22g
Loss/Gain	178g loss
Total duration of heat given	2hr 16 min

Table 7: Organoleptic characteristics of *Kushmanda Kshara.*

Organoleptic characteristic	Characteristics feature
Color	Black
Odour	Characteristic
Taste	Astringent, salty
Appearance	Amorphous powder
Touch	Soft
Sound	No audible sound

Table 8: Physico- chemical analysis of *Kushmanda Kshara.*

SL.NO	Analytical parameters	Result
1	Total ash value (w/w %)	38.8
2	Acid insoluble ash(w/w%)	6.9
3	p^H	10.5
4	Water soluble extract (w/w %)	11.5
5	Alcohol soluble extract (w/w%)	13.6

INDICATION

The formulation *Kushmanda Kshara* is indicated in *Amashoola.*

DOSE

Kushmanda Kshara is suggested to be consumed in the dose of 2*Masha/* 2G.

MODE OF ADMINISTRATION[6]

Kushmanda Kshara is mixed with *Shunti Choorna* taken along with Luke warm water

ADJUVANT - Luke warm water.

Photographs showing the preparation of Kushmanda Kshara are shown below.

Fig.1: Sliced Kushmanda.

Fig. 2: Removal of seeds.

Fig. 3: Pieces kept for drying.

Fig. 4: After drying.

Fig. 5: Heating the pieces.

Fig. 6: Heating in the mudpot.

Fig. 7: After Heating.

Fig. 8: Fine powder.

Fig. 9: Final product.

DISCUSSION

Paneeya Kshara plays an important role in removing the *Ama*, improving the *Jataragni*, thus helps in the proper formation of *Dhatu* and *Ojas. Ksharas* are herbal ashes generally contain sodium, potassium, carbonate, calcium oxide, magnesium and silica.

Ksharas have more hydroxide compounds, therefore *Ksharas* are more *Teekshna*. *Kushmanda Kshara* has *Kashaya, Lavana Rasa* and Ruksha *guna*. *Kushmanda Kshara* is mainly indicated in *Shoola*, where it is explained under the context of *Amashoola. Kushmanda Kshara* is mixed with *Shunti Choorna* which causes *Amapachana* and reduces the *Shoola.* If *Kshara* burns the *Eranda Naala* in 100 *Matra Kala,* then it is considered as a good *Kshara.*[7]

The mature fruit also contains organic acids such as malic and citric acid which reduces pain and inflammation. *Pakwa Kushmanda* contains 95% of water content[8], removal of outer peel and inner seeds have shown reduction in weight, slicing and drying it for 15 days showed significant reduction in weight and during the preparation of *Kshara*, the weight of the

formulation reduced. Thus, the final product obtained is 22g. As *Kushmanda* contains more water, drying of the *Kushmanda* was very difficult for 15 days as there might be chance of growth of microbes because of improper drying and unfavorable seasons for drying also might be the probable loss in the final product. Inappropriate drying causes improper formation of *Kshara*, thus it may hamper its action. There might be chance for contamination during open drying of *Kushmanda* pieces. Entire *Kshara* preparation took 2hrs 10minutes from the time where the dried flakes are kept in the *Sharava* till the fumes get subsided. Continuous inspection is carried out throughout the preparation to observe the color and consistency. Constant heat was given to the *Sharava*, stove kept off when the fumes from the *Sharava* got stopped. Kept for self-cooling, later the obtained *Kshara* is pounded into fine powder, there might be few quantities loss during pounding. *Kushmanda Kshara* possess hygroscopic nature[9], it should be powdered properly and stored in airtight glass container. *Kshara* produced tingling sensation when kept on the tongue. *Kushmanda Kshara* has P^H of 10.5 which is moderately alkaline. Studies suggest that alkaline food can aid in the reduction of inflammation, including the brain, gut, skin and muscles. The data obtained from pharmaceutical and analytical study can be considered as preliminary parameters of *Kushmanda Kshara*. Then analysis of *Kshara* showed that, it is genuine and the values of quality were comparable with API standards.

CONCLUSION

Kshara is a unique dosage form derived from plant, mineral and animal source containing alkaline substance. *Kshara* can be used internally and externally in various diseases. *Kushmanda Kshara* is a type of *Mridu Kshara* mentioned in *Bruhat Niganthu Rathnakara* for *Amashoola*. *Kushmanda Kshara* is easy for preparation, cost effective and it can be recommended in different *Shoola*. The preliminary physico- chemical analysis values suggest that the total ash is 38.8 w/w%, acid insoluble ash is 6.9 w/w%, p^H is 10.5, water soluble extract is 11.5 w/w%, alcohol soluble ash is 13.6 w/w%. It can be a better choice in clinical practice, if its efficacy is explored through clinical trials.

REFERENCES

1. Madhur Shrikrishnalal Dattaram., Bruhat Niganthu Rathnakara:Khoemaraj Shrikrishna Prakashana, Bombay; Edition, 1996; 5(6): 639.
2. Madhur Shrikrishnalal Dattaram, Bruhat Niganthu Rathnakara; Khoemaraj Shrikrishna Prakashana, Bombay; Edition, 1996; 5(6): 637.

3. Chunekar K.C, Pandey G.S., Bhavaprakasha Niganthu(Shaka Varga). Reprint. Varanasi; Chaukambha Bharathi Academy, 2015; 666.
4. Sharma P., Sharma G., Kaiyadevaniganthu(Aushadhi varga), Varanasi; Chaukhambha Orientalia, Reprint, 2016; 97.
5. Bapalala G Vaidya., Adarshaniganthu, Varanasi; Chaukhambha Orientalia, Edition, 1998; 618.
6. Madhur Shrikrishnalal Dattaram., Bruhat Niganthu Rathnakara; Khoemaraj Shrikrishna Prakashana, Bombay; Edition, 1996; 7(8): 663.
7. Muhammad Torequal Islam Cristina Quispe. et.al. A Literature-Based Update on *Benincasa hispida* (Thunb.) Cogn.: Traditional Uses, Nutraceutical, and Phytopharmacological. Journal of oxidative medicine and cellular longevity 2021 Dec., 10, 2021; 6349041.
8. Shiv Om Dixit, Ravindra Angadi, Sunil Kumar Koppala Narayana. Comparitive Physico - Chemical Analysis of Apamarga Kshara samples prepared in prepared in presence of Jala and Gomutra. Journal of Ayurveda Medical Science, 2017; 2(3): 244-6.
9. Hasmukh R Jadhav, R Galib, Pradeep Kumar Prajapathi. Pharamceutical Standardization of Apamarga Kshara. Journal of Ayurveda Integrated Medicine Oct- Dec., 2015; 6(4): 290-294.
10. Kanakhara R. Comparative pharmacognostical analysis through quantitative micrometry and analytical study on Mridu and Tikshna Apamarga Kshara. Ayu., 2018; 39: 159-64.