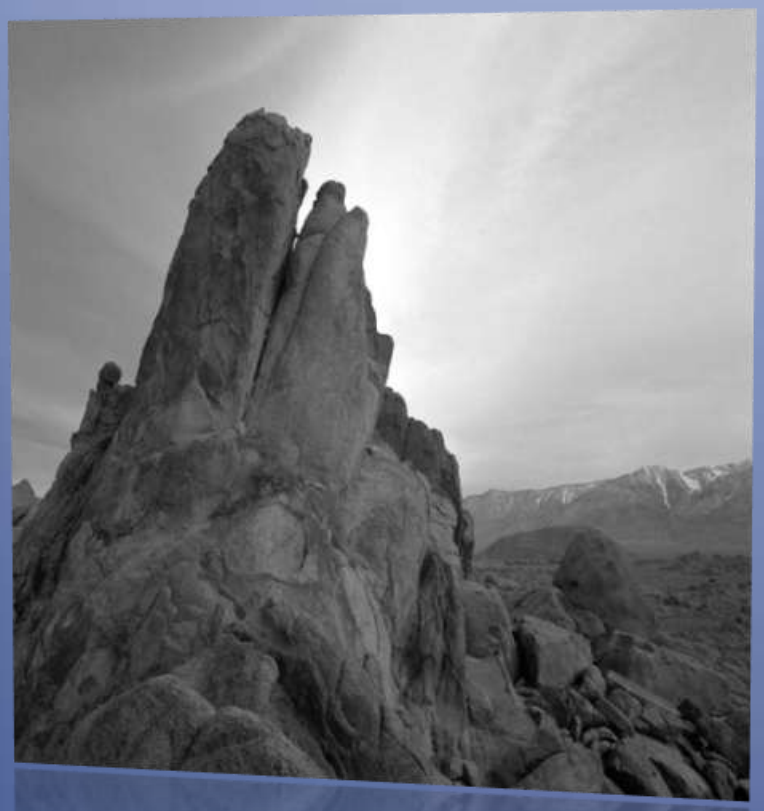

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Pharmaceutico - Analytical Study of *Dwiguna Bali Jarita Kajjali*

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ABSTRACT

Rasashastra science, described several herbo mineral formulations, in that Kajjali is one of the ingredients present in it. Generally to prepare *Kajjali*, equal quantity of *Parada & Gandhaka* is mentioned for many of the formulations. However, few of the formulations contain *Parada & Gandhaka* in weight ratio of 1:2. In the present study, preparation of *Dwigunabali jarita Kajjali* was carried out as per *Ayurvedic* text reference. Study was intended to estimate the Physico chemical analysis with the help of Loss on drying, Ash value, Water soluble, Acid insoluble ashetc.The findings of results were close to its standard value and have shown the purity of *Dwigunabali jarita Kajjali*.

KEYWORDS

Parada (Mercury), Gandhaka (Sulfur), Khalwa yantra (Mortar & pestle), Shodhana (Purification), Dwigunabali jarita Kajjali, Sudha (Lime stone), Lashuna Kalka (Garlic paste) & Analytical study

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INTRODUCTION

In *Rasashastra* science, several formulations are mention for different purpose. Most of the formulations are herbo-mineral compound which specially contains *Parada & Gandhaka* as major ingredients. It has been advised that these two compounds should be used in amalgamated form i.e. *Kajjali* form. To prepare *Kajjali*, take *Gandhaka* in prescribed quantity mix it with *Parada* and ground well without adding liquid, when it turns in to smooth homogenous black powder[1]. In several medicinal formulations, purified Mercury & purified Sulfur are mixed in different weight ratio. As a rule this proportion is to be taken in equivalent quantities[2]. Although in some formulations, these two compounds have been specified to be applyingin different proportions. In such cases, *Kajjali* should be prepared by these two compounds in the particular amount. Examples for this are *Panchamruta parpati, Gagana parpati* & *Saptamruta vati* etc[3,4,5]. In these formulations, the weight ratios of *Parada & Gandhaka* are taken in 1:2 parts & processed in to *Kajjali* known as *Dwigunabali jarita Kajjali*. After finishing point of procedure, this *Kajjali* must be tested to determine its suitability for curative purpose. Due to addition of herbal media in purification process of *Parada & Gandhaka* can make the *Kajjali* bioavailable[6]. Therefore an attempt was made from the study "Pharmaceutico- analytical study of *Dwigunabali jarita Kajjali*" to provide scientific data & efficacy with this project by-

AIM & OBJECTIVE OF THE STUDY

1. Preparation of *Dwigunabali jarita Kajjali* by classical method.
2. The Pharmaceutico-Analytical study of *Dwigunabali jarita Kajjali*.

MATERIALS & METHODS

Materials:

Source data: Genuine raw materials was procured from local market & authenticated as per *Ayurvedic* criteria in *Rasashastra & Bhaishajya kalpana* department of Shri J.G.C.H.S.*Ayurvedic* Medical College, Ghataprabha.

Pharmaceutical source: Preparation of *Dwigunabali jarita Kajjali* was carried out in teaching pharmacy of Shri J.G.C.H.S.*Ayurvedic* Medical College, Ghataprabha.

Analytical source: Analytical studies were carried out at- Qualichem Laboratories Gokulpeth market, Dharampeth extn, Nagpur- 440010.

Methods: The raw materials of *Parada* & *Gandhaka* were purified before prepared them in to *Kajjali.*

Pharmaceutical study:

a. Purification of *Parada*

Procedure: *Parada* (1000gm) & *Sudha churna* (1000 gm) were mixed, triturated in a clean *Khalwa yantra* (mortar & pestle) for 3 days (36 hours). The obtained materials washed with the help of Luke warm water for several times till the *Parada* was obtained & filtered through clean cotton cloth. Hereafter, obtained *Parada* was taken with *Lashuna Kalka* (760 gm) & *Saindhava churna* (380 gm) in a clean *khalwa yantra* & triturated for 3 days. This *Parada* was washed with Luke warm water for many times till the fresh *Shodhita Parada* was obtained. Approximately 700gm of *Shodhita Parada* was collected (Table no 1, 2 & 3)[7].

Table 1 During *Parada Shodhana*

Time	Triturating with *Sudha churna*
3 hours	Formation of Small globules of *Parada* in *Sudha churna*.
6 hours	Mixture turned to light grey color.
18 hours	Small particles of *Parada* started to spill out side.
36 hours	*Sudha churna* turned to dark grey color.
While washing	Hot water turned to light grey color.
On repeated washing	Formation of colorless water & Settlement of *Parada*.

Table 2 During *Parada Shodhana*

Time	Observations in triturating with *Lashuna kalka & Saindhava*
45 minutes	Formation of small globules of *Parada, Lashuna Kalka* turned to black color.
15 hours	Presence of Small particles of *Parada in Lashuna Kalka*.
15 hours	Mixture was turned to dark grey color.
36 hours	While washing, *Parada* particles were started to mix with each other.

Table 3 *Shodhita Parada*

Physical appearance	Bright & silvery
Wt of *Parada* after Trituration with *Sudha churna*	760 gm
Wt of *Parada* after Trituration with *Lashuna Kalka & Saindhava*.	700 gm
Loss of weight	300 gm

b. Purification of *Gandhaka*

Procedure

3 liters of *Godugdha* (cow's milk) was taken in steel jar & dry clean cotton cloth was tied to cover the mouth of jar vessel. *Goghrita* (cow's ghee) was taken in a steel vessel, heated on mild fire. *Goghrita* completely melted, powder of *Gandhaka* was added. The mixture was stirred well. After some time *Gandhaka* was liquefied completely then poured through cloth and filtered in to *Godugdha*. The physical impurities were remained on cloth. After *swangsheeta* (self cooling), *Shodhita Gandhaka* was taken out

from *Godugdha* and washed out with hot water till it gets free from *Goghrita*. This process was repeated for 3 times. Finally, *Shodhita Gandhaka* was washed with water and dried to get in purified form (Table no 4, 5 & 6)[8].

c. Preparation of *Dwigunabali jarita Kajjali*

General Method *Kajjali*

Procedure:*Shodhit Parada* (700 gm) & *Shodhit Gandhaka* (1400 gm) was taken in to clean *khalwayantra* in the weight ratio of 1:2. Grinding was done till the homogenous black powder was obtained. Prepared *Kajjali* was confirmed by testing with *Ayurvedic* Parameters. The weight of the finished product was 2030 gm (Table no 7 & 8)[9].

Table 4 Weight changes during *Gandhaka Shodhana*

Procedure	Raw *Gandhaka*	*Goghrita*	*Godugdha*	Wt after process	Weight loss
1st	2000 gm	2000 gm	2 Liter	1960 gm	40 gm
2nd	1960 gm	1960 gm	2 Liter	1930 gm	30 gm
3rd	1930 gm	1930 gm	2 Liter	1900 gm	30 gm

Table 5 During *Gandhaka shodhana*

Time	Observations
While filtering	Physical impurities were remained on the cloth.
After pouring in to milk	Blackish colored *Ghrita* was floating on the surface of milk.
After each process	Color of *Gandhaka* became lighter.
After end of process	Odor of *Gandhaka* was reduced.

Table 6 Organoleptic charactestics of *Shodhita Gandhaka*

Parameters	Raw *Gandhaka*	*Shodhita Gandhaka*
Consistency	Hard	Soft & brittle, no crystals
Color	Yellow	Bright & pale yellow
Luster	Shiny	Diminished
Odor	*Lashuna Gandhi*(Garlic smell)	As of *Goghrita*
Taste	Bitter	Tasteless
Touch	*Khara* (Rough)	*Snigdha* (unctuous)

Table 7 During grinding process of Dwigunabali *jarita Kajjali*

Time	While Preparation of *Kajjali*
30 minutes	Mixture became greenish black color.
90 minutes	Mixture turned to light black color.
5 hours	Obtained blackish color with shiny particles.
12 hours	Softness in mixture.
26 hours	*Khara* (Rough) in touch.
32 hours	Dark black color & *Nirdhumatva* (Absence of fumes)
48 hours	Slightly *Rekhapurnatva* (Fine) and *Slakshnatva* (Soft)
63 hours	Attained *Rekhapurnatva* and *Slakshnatva*
72 hours	*Varitara* (Floating) test were positive.
81 hours	*Nishchandratva* (Lusterless) & *Kajjalabhasa* (Blaskish)
84 hours	Showed completion of *Kajjali*

Table 8 Organoleptic characteristics of Dwigunabali jarita Kajjali

Consistency	Fine powder.
Color	*Kajjalabhasa* (Black color)
Luster	*Nishchandra* (Lusterless)
Odor	*Nirgandha* (odorless)
Touch	*Rekhapurna* (Fineness)
Taste	*Niswadu* (Tasteless)
Total wt after prepn *Kajjali*	2030 gm
Total loss of weight	70 gm

RESULTS OF ANALYTICAL STUDY

Table 9 Change in % after completion

Sample	**Test**	**Before *Kajjali***	**After *Kajjali***
Parada	Titrimetry method	98.44 % w/w	4.04 % w/w
Gandhaka	A.P. method	98.90 % w/w	7.91% w/w

Table 10 Analysis of *Dwigunabali jarita Kajjali*

Test	**Values**
Color / consistency	Black color / powder
Loss on drying	2.59 % w/w
Total ash	1.87 % w/w
Total ash	1.87 % w/w
Acid insoluble ash	0.64 % w/w
Acid soluble ash	2.48 % w/w
Water soluble ash	2.14 % w/w

DISCUSSION

Pharmaceutical study:

Raw Mercury & Sulfur was found to be 98.44 % w/w & 98.90 % w/w, respectively. After preparation of *Dwigunabali jarita Kajjali*, values was found to be 4.04 % w/w & 7.91 % w/w respectively (Table no 9). Total weight of *Shodhita Parada* was lost due to spilling of mixture during Grinding process & small fine particles remained adherent to *Khalwa*, *Sudha churna*, *Lashuna Kalka* which was difficult to recover. Time taken for accomplishment of *Dwigunabali jarita Kajjali* approved all classical parameters was 84 hours (Table no 7). Completion test indicated its complete formation i.e. *Nishchandra* test indicated no free Mercury particles. *Rekhapurna* test indicated its fine state. *Varitara* test indicated its light in weight. Concerning to Organoleptic characteristics, the color of *Dwigunabali jarita Kajjali* was dark blackish powder (Table no 7 & 8).

Analytical study

Loss on drying was 2.59 % w/w. This indicates that moisture content is in minimum limit which prevents degradation of the product. Total ash value was 1.87 %w/w, which means percentage of inorganic content is less in the sample & indicated the

purity of the obtained *Dwigunabali jarita Kajjali*. Acid insoluble ash was found 0.64 % w/w, showed less adherent dirt and sand particles in the sample. Acid soluble ash was 2.48 % w/w, this showed the presence of inorganic constituents. Water soluble ash was found 2.14 %w/w, shows the presence of inorganic compound (Table no 10). Analytical method revealed the percentage of Mercury & Sulfur was reduced after *Dwigunabali jarita Kajjali* preparation (Table no 9). Here the ratio of mercury and sulfur was found approximately 1:2(Table no 9).

CONCLUSION

- The quantity of *Shodhita Parada & Gandhaka* in 1:2 weight ratios may potentiate the efficacy of *Kajjali* as well as the formulation.
- Triturating for lengthy duration may be attributed to transform in chemical nature of the *Dwigunabali jarita Kajjali*.
- The data obtained from Physico chemical analysis of *Dwigunabali jarita Kajjali* can be considered as reference for its standardization.
- Additional analytical study is required further to investigate the *Dwigunabali jarita Kajjali* to set the reference standard for the quality control and quality assurance.

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