

PHARMACEUTICAL PREPARATION OF MAKARADHWAJA BY SAMANYA SHODHITA SWARNA THROUGH EMF METHOD***¹Dr. Mukesh Chaudhari, ²Dr. Kamal Rathore and ³Prof. K. Shankar Rao**¹PhD Scholar, National Institute of Ayurveda, Jaipur.²Asst. Professor, K.G. Dwiwedi Ayurvedic College, Jhansi.³HOD, P.G. Dept. of Rasashatra and Bhaishajya Kalpana, National Institute of Ayurveda, Jaipur.Article Received on
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Institute of Ayurveda, Jaipur.**ABSTRACT**

Ayurveda is the Science of life and longevity. Its principle aim is *Swathasya swastha rakshanam* and second is *Aaturasya Vikara prashamanam*. Second aim is achieved through using broad spectrum of medicines, comprising different herbal, herbo-mineral drugs. *Rasashatra* and *Bhaishajya kalpana* is the branch of *Ayurveda* specially designed to prepare the medicines and practising since long ago to achieve the aim. There is a special category, *Kupipakwa rasayana* or medicines which deals with formation of various potent and broad spectrum nano particle sized medicines. *Makardhwaja* is

one of the *Kupipakwa rasayana*, prepared from *Swarna*(Gold metal), *Parada*(Mercury) & *Gandhaka*(Sulphur). This is very useful medicine in various infections, against different toxins, prevents premature aging, increases vigor & vitality, IQ. It's very good aphrodisiac also. In this study *Makardhwaja* is prepared from *Samanya Shodhita Swarna* foil. Instead of using classical method of *Valuka yantra* Electric Muffle Furnace (EMF) was used.

KEYWORDS: *Swasthya, Aatura, Makardhwaja, Kupipakwa, Muffle furnace.***AIMS AND OBJECTIVES**

- 1) To study the *Kupipakwa Rasayana Nirmana*.
- 2) To study the challenges occurring in *Kupipakwa rasayana* having *Swarna* as main material.

INTRODUCTION

Ayurveda is the most preferred science in whole world now a days, as well as its pharmacological preparations have gained momentum all over the world because of newly emerging disease diathesis and failure of conventional modern medicines. Various herbal, herbo-mineral formulations are prepared by the Pharmaceutical company. There are group of medicines, *Bhasma*, *Kupipakwa rasayana*, *Pottali*, *Parpati* which are much preferred regarding their potential actions & micro-dosing pattern in humans. *Makardhwaja* is one of the *Kupipakwa rasayana* made from *Swarna*, *Parada* and *Gandhaka*. *Kupipakwa rasayana* preparation requires specific heating device which provides gradual heat. *Valuka Yantra* or EMF(Modern era's heating device) is used for this purpose of gradual heating. *Kaanchkupi*(Glass bottle) is used which is covered with mud smeared cotton cloth for 7 times. This specific *Kaanchkupi* is useful in receiving and transferring gradual heat to ingredients as it is covered with mud smeared cotton cloth. This *Kupipakwa rasayana nirmana* usually takes 12-24 hrs depending upon the raw material (*kajjali*), heating pattern. *Makardhwaja* is highly effective as *Rasayana*, *Vajikarana*.

MATERIAL AND METHODS

Literary material for this *Makardhwaja rasayana nirmana* is referred from classical texts of *Rasashatra* and *Bhaishajya kalpana*. *Shuddha Swarna*(24 karat Gold metal), *Hingulottha parada* and *Shuddha Gandhaka* is used in *Makardhwaja* preparation in the proportion of **1:8:16** respectively. 10 gm of *Swarna patra*:80 gm of *Hingulottha Parada*:160 gm of *Shuddha Gandhaka* is used.

Table No. 1: Showing details of processes involved with Raw material & Product(*Shuddha*) material obtained.

Sr. No.	Process	Raw material	Product obtained
1	<i>Hingula Shodhana</i>	150 gm	153 gm
2	Parada Extraction from Hingula	153 gm	105 gm <i>shuddha parada</i>
3	<i>Gandhaka shodhana</i>	200 gm	182 gm
4	<i>Swarna patra nirmana</i>	10 gm (24 Karat)	60 inch long & 1 inch wide <i>Swarna Foil</i>
5	<i>Swarna Pishti</i> (Amalgam) <i>Nirmana</i>	10 gm <i>Swarna</i> + 80 gm of <i>Shuddha Parada</i>	90 gm
6	<i>Kajjali Nirmana</i>	90 gm amalgam+160 gm <i>gandhaka</i>	250 gm
7	<i>Kumari Swarasa Bhavana</i>	<i>Kajjali</i> + <i>kumari swarasa</i>	
8	<i>Makardhwaja Nirmana</i> (<i>Kupipakwa</i>)	250 gm	84 gm <i>Makardhwaja</i>

Parada extraction from Hingula**a) *Hingula shodhana***^[1]**Principle- *Bhavana*****Duration: 3 hrs**

- 1) 150 gm of *Hingula* was taken in mortar and made into fine powder.
- 2) Then that powder is *levigated* with *Nimbu swarasa*. 25 ml of *Nimbu swarasa* was used to levigate the *hingula* powder.
- 3) Weight of *Hingula* after *shodhana* increased by 3 gm.

b) *Parada Extraction from Hingula***REFERENCE**^[2]**Type of Procedure: *Urdhva Patana*****Duration: 24 hours****Procedure**

Cotton cloth equal in wt. of *Hingula* was taken and *Shuddha Hingula* was spread over it. Then that cotton cloth was rolled from both side in opposite direction to make a bolus which was tied up loosely by a cotton thread. The cotton cloth bolus was kept in an *Sharava*(earthen pot) properly and *Sharava* was placed in the center of a large tray. The bolus was ignited by match stick and it was explored to air for few minutes. The *Sharava*, then covered by a *Nada* fully on 3 small pieces of bricks which were put around the *Sharava*. Whole cotton bolus was burnt completely, it was allowed to self-cooling. After self-cooling, the *Nada Yantra* was carefully taken and *Parada* was procured by scrapping from inner side of *Nada Yantra* with the use of small pieces of cotton cloth. The ash of cotton cloth was washed with hot water and procured *Parada* then filter through the cloth. 105 gm (70% of *Hingula*) of *shuddha parada* was obtained from this method.

Gandhaka Shodhana^[3]**Principle- *Dhalana*****Procedure**

Gandhaka powder(200 gm) was taken in a steel vessel and heated with *Goghrita* (40gm) over *Mandagni*. 800 ml of Hot *Godugdha* was taken in another steel vessel and the piece of cloth smeared with *Goghrita* was tied on the mouth of the vessel. When *Gandhaka* got melted, it was poured into the vessel containing *Godugdha* through the cloth. Then this vessel was subjected to heat for 1 hr for *Swedana* process. After self-cooling of that *Gandhaka* pot,a

solid mass with some granular part of *Gandhaka* was taken out of the vessel and then washed with hot water (3 times). The same procedure was repeated for 3 times and fresh milk and *Goghrita* was taken every time. After drying it was powdered, weighed and kept in a glass jar.

Table No. 2: Showing details of *Gandhaka shodhana*.

<i>Sodhana</i>	Temp. during melting	Duration of melting	Amt. of Milk	Amt. of Ghee	Wt before <i>Sodhana</i>	Wt after <i>Sodhana</i>	Loss of weight
1st	118°C	3 minutes	800 ml	40 g	200 g	192 g	8 gm
2nd	118°C	6 minutes	800 ml	40 g	192 g	186g	6 gm
3rd	118°C	6 minutes	800 ml	40 g	186 g	182 g	4 gm

Swarna patra nirmana

24 karat 10 gm of *Swarna* biscuit was purchased from local Sarafa market of Jaipur. That was made into foil of 60 inch long and 1 inch in breadth by same Sarafa dealer. That was not *Kantakavedhi swarna patra*.

Samanya Shodhana of Swarna^[4]

REFERENCE

Type of Procedure: *Nirvapana*

Equipments: Hand Blower, Forceps, funnel, measuring glass, weighing machine.

Ingredientes: *Sh. Swarna Patra, Tila Taila, Takra, Gomutra, Kanji, Kulatha Kwatha*.

Table No. 3: showing details of *Shodhana dravya nirmana*.

Raw Material	Reference	Principle	Quantity	Duration
<i>Takra</i>	<i>Sushruta sutra</i> ^[5]	<i>Manthana</i> (churning)	1 lit	20 mins
<i>Kanji</i>	RRS ^[6]	<i>Sandhana</i> (Fermentation)	1 lit	15 days
<i>Kulatth kwatha</i>	Sha.M.K. ^[7]	<i>Kwatha</i> (Decoction)	1 lit	60 mins

Table No. showing *shodhana dravya* for *Swarna Patra* quantity used.

Name	Amount	Total amount
<i>Ashuddha Swarna</i>	10 gm	10 gm
<i>Til taila</i>	100 ml	700 ml
<i>Takra</i>	100 ml	700 ml
<i>Gomutra</i>	100 ml	700 ml
<i>Kanji</i>	100 ml	700 ml
<i>Kulttha kwatha</i>	100 ml	700 ml

Procedure

Ashuddha Swarna Patra, holded in Iron forcep was heated by Hand blower. It was heated upto it became red hot & then immersed in *Til taila*. This procedure was carried out for 7 times. Each time fresh liquid media was taken. This procedure was repeated for each liquid media. After completion of process *Swarna Patra* was washed with hot water for 7 times.

OBSERVATIONS

1. During the immersion in the *Tila Taila Swarna Patra* caught fire for few seconds.
2. Oily drops appeared on surface of *Takra* after immersion. Cracking sound was found during immersion.
3. Shining of *Swarna Patra* was increased after immersion in Kanji.
4. *Gomutra* became darker after immersion.
5. Shining of *Swarna Patra* increased after immersion in *Gomutra*.
6. Blackish colour of *Swarna Patra* after immersion in *Kulattha Kwatha*.

There was no change in weight of *Swarna patra* after *samanya shodhana*.

Swarna Pishti Nirmana

Shodhit Swarna Patra (10 gm) was taken and it was cut in to fine pieces. The pieces were taken in Porcelain *Khalwa yantra* and 80 gm of *Shuddha Parada* (purified mercury) was added into it gradually. *Mardana* was carried out for *pishti* formation. As the *Mardana* was started the pieces of *swarna* turned into silver colour. This process was completed after the amalgam was formed. The *nimbu swarasa* was added and *mardana* was carried out. It required about 15 hrs to form amalgam. Then *Nimbu swarasa* was washed with water. The semisolid, soft silver colour *pishti* (paste, amalgam) was formed.

Kajjali Nirmana

A *Swarna pishti* was taken into Porcelain *khalwa yantra* and 160 gm of *Shuddha Gandhaka* was added into it in equal quantity. *Kumari swarasa bhavana* was given after *Kajjali* formation. Total 18 hrs *mardana* was done with *kumari swarasa*.

Makaradhwaja Nirmana**Principle: Kupipaka****Procedure**

1. A *kaanckupi*(glass bottle) was taken & covered with mud smeared cotton cloth for 7 times, every time allowed to dry and next coating was applied.
2. *Kajjali* was filled through funnel into the *kaanckupi*(glass bottle).
3. That *Kaanckupi* then placed in EMF for giving *Agni*.
4. Gradual heat was given, i.e. *Mandagni*, *Madhyamagni* and *Tivragni* step by step.
5. Total 20 hrs heat was given to *Kaanckupi*.
6. *Mrudu agni*(upto 250⁰C) for 6 hrs, *Madhyamagni*(250⁰ - 450⁰) for 7 hrs and *Tivragni*(450⁰ - 650⁰) for 7 hrs.
7. Then after that *Kaanckupi* was allowed to self-cooling for next 24 hrs.
8. After 24 hrs, after self-cooling of furnace and *Kupi*, it was taken out and the outer layers were scrapped with the knife. A thread soaked in kerosene oil was tied all around the bottle bellow one-inch level from compound and set to fire.
9. Burning the thread, small amount of water was sprinkled on the hot bottle surface to break that bottle. The final product, *Makaradhwaja* was collected from neck of the bottle and residue part of *Makaradhwaja* (Swarna powder) was collected from inside the bottom of bottle.

Table No. 1: Giving details of Time, Temperature setting, Recorded Temperature & Observations.

Time(Hrs)	Temp.setting	Temp.recorded	Observations
00.00	100 ⁰ C within 8 mins	39 ⁰ C	
1.00	100 ⁰ C		
1.15	150 ⁰ C	117 ⁰	
1.37	150 ⁰ C		
2.50	160 ⁰ C		
3.00	170 ⁰ C		White fumes started
3.10	200 ⁰ C	168 ⁰ C	
3.20	205 ⁰ C		
3.50	200 ⁰ C		Light yellow fumes in <i>Kupi</i>
5.00	200 ⁰ C		
5.10	250 ⁰ C		Dark yellow fumes in <i>Kupi</i> ,slightly outside
6.00	300 ⁰ C	250 ⁰ C	
6.10	300 ⁰ C		
6.15	327 ⁰ C		
6.30	350 ⁰ C	302 ⁰ C	<i>Kajjali</i> start to melt (dark yellow fumes outside of <i>kupi</i>)

8.00	350 ⁰ C		<i>Kajjali</i> fully melted
9.30	400 ⁰ C	350 ⁰ C	
11.00	450 ⁰ C	400 ⁰ C	
11.25	425 ⁰ C		
12.00	440 ⁰ C		
12.15	450 ⁰ C		
13.00	500 ⁰ C	450 ⁰ C	
13.05	489 ⁰ C		Flames started up to 7-8 inches
13.15	498 ⁰ C		Flames gradually increased in height
13.18	500 ⁰ C		
13.25	500 ⁰ C		Flames gradually decreased in height
13.50	500 ⁰ C		Flames seen only in <i>Kupi</i>
14.00	550 ⁰ C		
14.15	551 ⁰ C		
15.05	551 ⁰ C		Flames disappeared & red hot bottom seen
15.10	551 ⁰ C		Corking done
16.00	600 ⁰ C	550 ⁰ C	
16.40	600 ⁰ C		
18.00	650 ⁰ C	600 ⁰ C	
18.13	656 ⁰ C		
20.00	650 ⁰ C		Stopped, allowed to self-cooling.

RESULT

84 gm *Kupipakwa rasayana Makardhwaja* is obtained from 250 gm of *Kajjali*. 11.0138 gm of *swarna* particles were obtained at bottom of *kaanchkupi*.

DISCUSSION

Makaradhwaja Rasayana preparation was done as per *Rasatarangini*. In this method *Shuddha Swarna, Hingulottha Parada & Shuddha Gandhaka* is taken in the ratio of 1:8:16. This *Makardhwaja* preparation is done in *kaanchkupi* by specific heating pattern provided by EMF. In classics for this procedure *Valuka Yantra* was used. But EMF has successfully replaced the *Valuka Yantra*. As all materials used should be in purified form, *Shodhana* of *Swarna* and *Gandhaka* was carried out. As *Hingulottha parada* is almost pure, its purification is not usually advised and so not done⁷. Different classical references used in *Shodhana* of *Hingula, Gandhaka & Swarna* as mentioned earlier. There was some loss (18 gm) in *gandhaka shodhana, Hingulottha parada* extracted was almost 70% of *Hingula* taken. *Swarna* used was 24 Karat so in *samanya shodhana* of *Swarna* there was 0% loss. Loss in *Shodhana* process is due to washing out or burning of some impurities, but as *Swarna* was already 24 karat, it had no impurities as per metallurgy and *samanya shodhana* process validated that.

Swarna patra was made from Gold biscuit, but it was not *Kantakavedhi Swarna Patra*. As it was used to prepare *Swarna Pishti* (amalgam) it was not made into *Kantakavedhi*. After adding *Parada* in *Swarna patra mardana* was done for 15 hrs, it made *Swarna pishti*. That *swarna pishti* was then used to form *Kajjali*, by adding *Shuddha Gandhaka*. For making *Nischandra Kajjali* 18 hrs of *mardana* was done. This *mardana* helps to form strong bonding between *Parada* and *Gandhaka* particles. *Bhavana* of *Kumari swarasa* was given to formed *kajjali*. Then *kajjali* was put into *Kaanchkupi* (covered with mud smeared cotton cloth). Gradual heating is given by EMF. In first 6 hrs *Mrudwagni* was given (temp.up to 250⁰C), then for next 7 hrs *Madhyamagni* was given (up to 450⁰C). In last 7 hrs *Tivragni* was given (up to 600⁰C). Heat was given for total of 20 hrs, in increasing order. As the temp.reach 170⁰C, white fumes started, then at 200⁰C light yellow fumes and at 250⁰C dark yellow fumes started. That fumes was coming out of *Kupi*. Fumes may be of sulphur present in *Kajjali*, it started to melt at 350⁰C after total 6.30 hrs of heating. At that time *Tapta loha shalaka* was used to keep neck of the *kupi* open from adherence of sulphur. As the temp.reached *madhyamagni* range, *Kajjali* started to melt with dark yellow fumes. After total 8 hrs of heat *kajjali* got fully melted and fumes were replaced by flames that may be due to directly burning of melted sulphur. Increasing the temp.flames reached up to 7-8 inches. After total 15 hrs of heating fumes disappeared at 551⁰C that may be due to complete burning of free sulphur present. Out of 160 gm of *Gandhaka* (sulphur) near about 155 gm of sulphur was burnt, 4 gm got added into *Parada* and 1 gm is mixed with *swarna* particles obtained at bottom of *Kupi*. After corking 5 hrs of *tivragni* was given that may be responsible for *Kanthastha Makardhwaja nirmana*. The red hot material which was present at the bottom of *Kupi* might have sublimated and condensed at the neck of *kupi*.

CONCLUSION

- 1) In this *Makardhwaja Nirmana* process *Mrudwagni* given for long time yields to maximum product (84 gms).
- 2) Loss of *Parada* in compound form is less.

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