IJAPC

Volume 11 Issue 2,
2019

www.ijapc.com

2350-0204

GREENTREE GROUP PUBLISHERS

Int J Ayu Pharm Chem

RESEARCH ARTICLE

www.ijapc.com

e-ISSN 2350-0204

Pharmaceutical Standardization of *Manikya Ras* –A *Kupipakwa Rasayan*

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ABSTRACT

Use of various metals and minerals and transformation of these inorganic substances into effective organic medicine in *Ayurvedic* system of the medicine is termed as *Kupipakwa Rasayan*. It is very laborious to prepare and require long duration for preparation. It is mercurial preparation with rapid action and synergistic effects in the body at very low dose. *Manikya rasa* is useful in *Rajayakshma* and *Kushtha*. Detailed knowledge regarding etymology, history, manufacturing process, instruments, standard temperature gradation with analytical study is discussed in the present study. This study definitely gives an idea about standard preparation of effective *Manikya rasa* to avoid discrepancies during manufacturing.

KEYWORDS

Kupipakwa Rasayan, Manikya Rasa.

Greentree Group Publishers

Received 20/06/19 Accepted 26/07/19 Published 10/09/19

INTRODUCTION

Kupipakwarasayan are highly potent and effective in minimum dose. The terminology *'Kupipakwa'* denotes the pharmaceutical processing that is involved in these preparation by heating in glass bottles[1]. The obtained product are preferred and frequently used by the Ayurvedic physician in their day to day practice[2].*Dunduknath*, author of *Rasendra Chintamani*introduced the preparation of *Kupipakwarasayan* during 12th century A.D. *Kupipakwarasayan* prepared by sholars of *Agastasampradayas* at first as *Yashodhara* had mentioned *Rasasindoor* as *"UdayaBhaskarras"* at *"Rasaprakashsudhakar"* in 13th century A.D.Mercuryis the main component *(Adhardravya)* of all *Kupipakwarasayan* other *Adheyadravya*like *Hartal*, *Manahshila*etc are required to potentiate Mercury. Sulphur is *Sadhakdravya* which helps in reaction[3].

Manikya rasa possess many different pharmaceutical methods in various scriptures of *Rasashastra*. In this present study *Manikyarasa* with *Rasayogsagar* Part II prepared with ingredient Mercury(*Parad*), Sulphur (*Gandhak*), Orpiment (*Hartal*), Realgar (*Manahshila*) and Lead (*Nag*)with purified form. *Kajjali* of all these mixture melts on heating *sanskar* to become Mercury potent. This is *Sagandhasagnimurchhana*. Study of standard heating pattern for the preparation of effective *Manikya rasa* with the help of pyrometer for temperature recording was conducted. This article strives to present the production of *Manikyarasa* with a standard operative procedure. The analytical methods with elemental assay help to reveal out the chemical composition of a formulation with their concentration and also ensure safety limits and accuracy of the medicine[4]. Hence, it will help other researchers to prepare a clinically effective medicine which also ensures safety limits and accuracy of medicine.

AIMS AND OBJECTIVES

Kupipakwa Rasayan is considered as a tough task. It requires more precautions, as any mistake can lead to wastage of drug and breakage of bottle. To be obliged to standardize manufacturing process of *Manikya rasa -Kupipakwa Rasayan*[5].

To analyze the prepared drug by *Ayurvedic* as well as modern method.

MATERIALS

Mercury (*Parad*), Sulphur *(Gandhak)*, Realgar (*Manahshila*) , Orpiment (*Hartal*), Lead (*Naga*) *ValukaYantra, Khalva Yantra,*

Kachkupi (A glass bottle) with *kapadmitti*, pyrometer, Fuel

Methods:

The preparation of *Manikyarasa* is divided into three stages- *Purvakarma, Pradhankarma, Pashchat Karma*

Purvakarma:

Raw material were procured from GMP approved store and tested according to mentioned in Ayurvedictexts. Purification of Mercury (*Parad*)[6]- 100gms Fig1,

Figure 1 Mercury

Sulphur (*Gandhak*)[7]- 100gmsFig 2,

Figure 2 Gandhak

Orpiment (*Hartal*)[8]- 100 gms Fig 3,

Figure 3:Hartal

Realgar (*Manahshila*)[9]- 100gms Fig 4,

Figure 4 Manahshila

Lead(*Naga*)[10]- 100gms Fig 5

Figure 5 Nag

were conducted and preparation of *Kajjali* was carried out as per classical reference shown in Fig 6.

Figure 6 Kajjali

A Glass bottle (*Kupi*coated with seven layer of mud smeared cloth having capacity 750 ml). *Valukayantra* (iron vessel filled with sand for placing the *Kupi*) and Bhatti, valuka, charcoal, wood were collected as per classical references and requirement. Lead was melted and then melted lead was poured into mortar containing Mercury.

Immediatetrituration was done forming Amalgam. Purified Sulphur, Purified Realgar, Purified Orpiment were added into amalgam and triturated up to complete lusterless powderformed. *Kajjali* was filtered through cloth. Three hundred grams of *Kajjali* was filled in the *Kupi* and was placed in the *valukayantra* in the center in such a way that *Kupi* could get equal distribution of heat shown in Fig 7.

Figure 7 Valuka Yantra

Pradhan Karma:

In the *pradhankarmakramagni* was given *MruduAgni :* Room temp to 200^{0}C (4 hrs),*Madhym Agni* :200^{0}C -450^{0}C (14hrs),*Tivra Agni*: 450^{0}C-650^{0}C (30 hrs) was given in *valukayantra*. A red hot iron rod was inserted in the neck of bottle at regular intervals for burning of accumulated sulphur. After confirmation of Copper plate test and red hot bottom test corking was done and the temperature increased by giving *tivragni*.

Pashat Karma

After self-cooling, the bottle was taken out, scraped broken as shown in Fig 8

Figure 8 Breking of Kupi

and the sublimate deposited at the neck of the bottle was collected and weighed. The residue at the bottom was also collected and weighed as shown in Fig 9.

Figure 9 Manikya Ras

RESULTS AND DISCUSSION

Table 1 Showing Time and Temperature along with observations during preparation of Manikya Ras

Day	Time	Temperature	Procedure	Observation
Day 1	7.30 am	35^{0}C		
	9.30 am	248^{0}C		Fumes started
	11.30 am	260^{0}C		
	12.30 pm	310^{0}C		
	1.30 pm	400^{0}C		Slight dense fumes
	11.30 pm	480^{0}C	Red hot *Shalakachalan*	Profuse fumes
	6.30pm	498^{0}C	*Shalakachalan*	Blue flame

	9 pm	510^{0}C	*Shalakachalan*	Yellow fumes burnt with blue flame
	11 pm	520^{0}C		Yellow fumes increased. Sulphur burnt
Day 2	2.30 am	530^{0}C	Cold iron rod inserted	*Kajjali* Melts
	6.30 am	566^{0}C		White Fumes
	11.30 am	578^{0}C		Fumes stopped
	12.30 pm	620^{0}C	Copper plate test	Copper color change to white
	1.30 pm	638^{0}C	Red hot base test	Red hot round at the bottom of *kupi*
	2 pm	646^{0}C	Corking was done	
	4.30 pm	680^{0}C	Sand is removed from neck of the bottle	
	5.30 am	690^{0}C		

Table 2 Showing weight of drug before and after

Total Kajjali taken	300 gms
Obtained ManikyaRas	85 gms
Total Residue weight	120gms

Kupipakwarasayan are considered to be hard to prepare. For its preparation, preparation of *Kajjali* and heating pattern are most important factors to obtain desired output and to increase efficacy of the product without any untoward effects. *Kramagni*me ans heating pattern (temperature gradation) should be followed during process of any *kupipakwarasayan* as mentioned in the classical texts. It means temperature pattern should be an increasing order but intermediate heating process. It is divided into three stages i.e. *Mrudu, Madhyam* and *Tivragni.* Here, *Mruduagni* indicates the melting stage of *Kajjali*, *Madhyamagni* indicates the boiling stage of *Kajjali* and the *tivragni* me ans immense heating which is given to ensure yield of the final product as shown in table no 1.

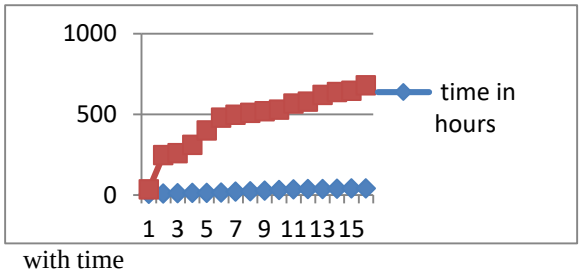
There are seven references of *Manikyaras*. By the reference of Rasayogsagar Part IIof*shloka*2539-2542 was prepared. Heating was given for 16 *yama* (48 hours). It was observed that white fumes started after 2 hrs at temperature 248^{0}C, slightdense fumes were seen after 6 hrs at temperature 400^{0}C, profuse fumes wereobserved after 16 hrs at temperature 480^{0}C. Red hot iron rod was inserted through the neck of the bottle (*Shalakachalan*) intermittently so as to avoid collection of excess sulphur at the neck .During *shalakachalan*sulphur burns with blue flame. After 10.30hrs attemperature510^{0}Cyellow fumes were observed and during *shalakachan* burn with blue flame. Yellow fumes were increased at a temperature 520^{0}Candafter that it was observed that sulphur was burnt. Kajjalimelts on 16thhour at atemperature of 530^{0}C, again *shalakachalan* process performed intermittently. After 20th hour at

a 566^{0}C temperature, white fumes were observed. Corking was done after performing confirmative tests of copper plate and red hot bottom test on 27.30th hour at atemperature 638^{0}C. *Tivragni* was given up to 48 hour with increasing temperature till 690^{0}C as shown in table 1. After *paschat karma* the total yield of bright red color. Gradual increasing temperature chart is shown by graphical presentation in chart 1.*Manikyarasa* was found to be85gms and residue was 120 gms. Total loss was 95 gms as shown in table no 2.Standardization was performed for *Kajjali* of *Manikyaras, ManikyaRas* and Residue. Test results are shown in table 3.

Table 3 Analytical observations of Kajjali, final drug and residue of Manikya Rasa[11]

Parameters	Kajjali (% w/w)	Manikyaras (%w/w)	Residue (%w/w)
Mercury (Hg)	18.77	43.56	Nil
Arsenic (As)	9.68	14.28	18.34
Sulphur (S)	39.14	26.42	31.63
Lead (Pb)	11.26	Nil	38.12
% LOD	0.16	0.02	0.02
Ash value	4.76	0.24	34.68

Chart 1 Graphical presentation of temperature chart with time



The present study was aimed at providing a guideline to simplify exigent procedure and standard temperature maintenance in the preparation of *Manikyar as*. By using pyrometer, temperature was standardize in celcious. This study gives a defined sequence of process involved in the formation of *Manikyarasa* by which researcher can perform the drug preparation scientifically to obtained expected output. Thereby we can say that *Manikya rasa* has been standardized in terms of time and temperature for 300gms of *Kajjali*i.e. *Mrudu Agni*: Room temp to 200^{0}C (4 hrs) *Madhym Agni* 200^{0}C -450^{0}C (14 hrs) *Tivra Agni*: 450^{0}C-650^{0}C (30 hrs) by conducting analytical tests on the parameters LOD, Ash value and Elemental as say as shown in table no 3.

CONCLUSION

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