PHARMACEUTICAL PREPARATION OF HINGULIO MANIKYA RASA W.S.R TO KUPIPAKWA RASAYANA

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***Abstract*: In Ayurveda Kupipakwa Rasayanas have very special place as they possesbetter medicinal properties. These Rasaushadhies have the quality to enhance the property of other Herbal medicine and drug which are mixed to them. In case they are used insmall doses they have catalytic effect. Hingulio Manikya Rasa is the Sagandha Kukipakwa Rasa which is obtained by special processing of Hingula (Hgs), Gandhaka(S), and Hartal(As2S3). The medicine under study *HINGULIO MANIKYA RASA* has been mentioned only is the text Rasa Tarangini. So the present study focused only on the pharmaceutical preparation of Hinguliomanikya rasa by kupipakwa method. It has been mentioned in the text, that *HINGULIO MANIKYA RASA* can cure the patients of Grahni and PuratanaAtisara.**

***Keywords*: KupiPakwa Rasyana, Hingulio Manikya Rasa, Hingula, Gandhaka, Haratala.**

Introduction

Rasa Shastra deals in metallic and herbo mineral preparations with various kalpanas including Kupipakwa Rasayana. While Rasaushadhi are mentioned in various rasa texts in terms of their effectiveness and it is in practice since ancient times. Rasaushadhi are very effective in many aspects like long lasting effects, ease of palatability, rapid onset of action, small dose and having better efficacy to cure the complex diseases (asadhyavyadhis)[1]

In Innumerable Rasashastra texts, there are two types of preparations of Rasaushadhies

1- Sagni:

These are Rasayana which are prepared with the help of agni,

Example:

- Kupipakwa Kalpana
- Pottali Kalpana
- Parpati Kalpana

2- Niragni:

These are Rasayana which are prepared without the help of agni,

Example:

- Kharaleeya Rasayana

Among these Kalpanas Kupipakwa Rasayanas are highly efficacious. Many Kupipakwa Rasayanas are described in classicial text, such as Sameerpannaga, Mallasindura, Talasindura, Makardhwaja etc.

The term “Kupipakwa Rasayan” is the combination of four words i.e.

Kupi+Pakwa+Rasa+Ayana

Kupi is - Kaachakupi

Pakwa is - Prepared with the help of fire

Rasa is - Parada
Ayana is - Sthana
It means the mercurial preparation made in glass vessel with the help of heat, istermed as Kupipakwa Rasayan.

CLASSIFICATION OF KUPIPAKWA RASAYAN

1- According to ingredients
It can be divided into two types-
(A) Sagandha Murchchhana Kupipakwa Rasayan:
Those Kupipakwa Rasayan which are prepared with the helpof gandhaka are called as Sagandha Kupipakwa Rasayan.
It can be again divided into four types-
(a) Preparation with Mercury and sulphur, e.g. *Rasasindura*
(b) Preparation with Mercury, sulphur and other Metals, e.g.*Tamrasindura, Rajatasindura etc.*
(c) Preparation with Mercury, sulphur and non Metallicelements , e.g. *Mallasindura, Talasindura, Shilasindura* etc.
(d) Preparation with Mercury, Sulphur, Non Metallic elements and gold, e.g. *Purnachandrodaya Rasa, Talachandrodaya Rasa* etc.
(B) Nirgandha Murchchhana Kupipakwa Rasayana:
Those Kupipakwa Rasayana which are prepared without gandhaka areknown as Nirgandha Murchchhana Kupipakwa Rasayana.
2 - According to place of production
(a) Galastha or Kanthastha[2,3,4]
(b) Talastha or Adhastha
(c) Ubhayastha
(a) Galastha or Kanthastha:
In Galastha type of Kupipakwa Rasayana, the prepared medicine is found at the neck of glass bottle (kanchakupi), e.g. *Rasasindura, Rasakarpura, Mallasindura, Hinguliomanikya Rasa.*
(b) Talastha or Adhastha:
In Talastha type of Kupipakwa, the prepared medicine is found at thebase of glass bottle (kanchakupi), e.g. *Sameerpannaga Rasa*.
(c) Ubhayastha:
In the Ubhayastha type of Kupipakwa the prepared medicine are found on the both places, at the the neck of bottle and also at the base of bottle *Purnachandrodaya Rasa*.
3 - According to the made of preparation
(a) Antardhuma Vidhi
(b) Bahirdhuma Vidhi
Present study focus on the pharmaceutical preparation of Hinguliomanikya Rasa by kupipakwa method.

PREPARATIONS

The Kupi Pakwa Rasa is that Rasa-Aushadhi which is made by a specialprocess. A glass bottle or kupi (which is smeared seven times with clay and cloth) with thedrug material inside it is kept in a Baluka Yantra at an appropriate temperature which gradually increases.The prepared medicine is taken out after the bottle gets self cooled. Kupipakwa nirmana can be divided into threesection.
1 - Pre preparative process (Purva Karma)
2 -Main process (Pradhan Karma)
3- After wards process (Pashchat Karma)
1- PRE PREPARATIVE PROCESS (PURVA KARMA)

Preparation of AatsiShishi (KaachaKupi) -

The bottle is taken, which is flat bottomed. Wine bottle or bear bottle can betaken, Bear bottle is preferred as in the bear bottle chances of breaking are low. All the three bottles are of one litter. Now all the three bottles are washed with water. Coarse powder of Multani Mitti is made and mixed with water for 24 hours. After 24 hours Multani Mitti is shuffled properly. Now markin cloth is taken and 21 pieces of cloth is made. Each clothshould cover the bottle properly. The width of cloth is taken 6 inch approx. The cloth is soaked in to Multani Mitti properly, soaked cloth is then embraced to the bottle, after embracing the cloth, bottle is placed in sun light for drying. After drying the next coating of Multani Mitti's cloth is done. In each coating 24 hours time is consumed, layer of cloth over bottle is madeis made very thin, total seven layers of cloth are made. In all the three bottles, all coatings should not be done simultaneously, each coating should be done at an interval of at least 24 hours, coating of Multani Mitti makes bottle stronger. The width of seven layer is kept approximately ½ - ¾ inch.

Preparation of cork

(Stopper -The stopper is made by brick piece, proper shape is obtained by rubbing thebrick; stopper has one pointed end, which can enter upto 1 inch into the bottle'smouth.Upper end made in rounded shape; this is called as cap of stopper.

Formation of Baluka Yantra -A strong iron cauldron (Kadahi) is taken. The width and depth of cauldron is taken in such a way so that it is fitted into the furnace. At the base of the cauldron, mica sheet is placed, mica is a bed conductor of heat and it gives uniform heat to Kanch Kupi. Kanch Kupi is set above the mica sheet and sand is filled upto the neck of Kanch Kupi. During sand filling, the mouth of Kanch Kupi. should be closed, other wises and particles will enter into Kanch Kupi. Now raw material of Medicine is filled into Kanch Kupi upto its 1/3 level with the help of funnel. In the Baluka Yantra the thermocouple of pyrometer is placed deeply. The tip of thermocouple should touch the base of cauldron. If salt is taken instead of Balu (sand) then the name of instrument will change to Lavana Yantra. Both sand (Balu) and salt (Lavana) are the bed conduction of heat.

Fuel -For heating inn the furnace, wooden fuel should be used. In one process of Kupi Pakwa Rasa nirmana, approximately 200 kg. fire wood is necessary,wood should be dry.

Amount of Medicine In Kanch Kupi -Medicine should be fill upto 1/3 part of Kanch Kupi and rest 2/3 part of Kanch Kupi should keep empty if excessive amount of medicine con- gested into the Kanch Kupi medicine will ooze out. Medicine should also be dry other wise Kanch Kupi can break during heating.

2- MAIN PROCESS (PRADHAN KARMA)

Kanch Kupi is kept in Baluka Yantra. By offering prayer to Lord Shiva, the fire is ignited. Heat is increased gradully. Heat should be given as per the norm; Mridu, Madhya, and Tirvaagni. Exernal temprature is measured by immersing the thermocouple in the sand touching the bottom of the bottle. After about an hour of strating the fire, thetemperature rase to 100^0C. The temperature should be rises to 200^0C in next one and half hour.

Gandhaka Jarana -After 2-3 hour of heating, Baluka Yantra becomes hot, and a smoke starts from of the bottle. After 2-3 hour sulphur melts, then we increases the intensity of heat. Smoking is a result of the burning of surplus. While heating it has to be ensured that mouth of the bottle is not blocked. Blockage occurs due to the deposition of the sulphur particles at the neck of bottle. If this blockage is not removed then bottle can burst. To avoid the blockage of the mouth, frequent stirring in the mouth of the bottle with the help of an iron rod is doe during the 'Madhyam Agni Pakaa'. The stirring should be done till the bluish yellow flames and smoke subsides. During stirring iron rod should not touch the bottom of the bottle otherwise it can harm the bottle. To ensure the proper Paka of medicine, we should smell theiron rod just after stirring, if sulphur's smell does not comes, we should interpret that Paka of medicine has been completed. Now we should stop stirring.

Kupi Mukha Mudrana -The sealing of the mouth of bottle is called Mudrana. Object with which sealingis done is called Mudra. Mudra is made by piece of brick. The synonyms of Mudra are, Mada Mudra, and Hath Mudra.

Examination On Before Clossing the Mouth -

1) Flames should get subsided and not emerge from the mouth of the Kanch Kupi (Bottle)
2) In the dark, on seeing Kanch Kupi from above, it should appear red hot at the bottom.

3) A copper coin has to be placed on the mouth of the bottle. If it turns silvery white it indcates the evaporation of mercury, it indicatesthat it is the proper time of Mudrana.
4) On entering an iron rod if no particles sticks on the rod , it indicates that it is the proper time of Mudrana.
5) On shedding torch light into the bottle , if evaporation of mercury's particles is seen then Mudrana should be done immediately.
Method Of Mukh Mudran -When the bluish yellow flames and smoke subside the sealing of the mouth should be done with the help of stopper and coating with mud and cloth for seven times. Mukh Mudran should be done at proper time, if we delay the Mukh Mudran after right time, medicine will be lost by evaporating.
Heat After Mukha Mudrana -After closing the mouth Ist½ hour slow intensity heat should be given, by slowheat coating f stopper become dry and hard. Now the temperature has to be increased to about 750^0C and is termed astivragni. Tivragni is given for six hour. In this phase whole medicine collects at the neck of bottle by sublimation. Tivragni ranges in between 500^0C to 750^0C.
Parameter's of Heat -In the initial phase mild heat should be given. In second phase medium heat should be given, and in the final phase high intensity heat should be given. Ranges of heat of all the phase are as follow
Mridu temp range - $100C^0$ - 250^0C
Madhyam temp range - 250^0C – 500^0C
Tivra temp range - 500^0C -750^0C
If in the last phase, heat is given below the prescribed range of temperature (500^0C-750^0C) then medicine will not form properly. And if heat is given at higher range than (>750^0C) then medicine will get evaporated. So heat should be controlled by seeingthe pyrometer's reading. During soft heating, medicine gets boiled and expels the fumes,and after some time flames starts. We have kept medium intensity of heat till the flames kept on emerging.

3- AFTER-WARDS PROCESS (PASHCHAT KARMA)
Self Cooling Of Baluka Yantra -After the stipulated period, strong heating has to be stopped and with out disturbing the Yantra and the bottle, it should left for self cooling. The self cooling takes place in about 24-36 hour. The Baluka should lowered down by one and half inch. On the next day after self cooling the Baluka is removed carefully and bottle should take out from the Yantra.
Breaking Of Kanch Kupi[(5)]-After self cooling the coating of Multani Mitti and cloth is removed through gentle scrapping. A string soaked in kerosene is wrapped around the abdomen of the bottle and is burnt. As soon as the string is burnt, a cloth soaked in water is wrapped on the area of string. The heated bottle when comes in contact of immediately and symmetrically breaks into two parts.
Extraction of Medicine From The Bottle -The sublime material at the neck and upper part of the bottle should be very gently and carefully scrap and collect. The residual material at the bot- tom of the bottle should also be collect. After Kupi-Pakwa procedure collected medicine should be testedby physiclly.
Physical Analysis Of Prepared Medicine -Physical analysis should be done by both Ayurvedic and Modern view.
In Physical analys is following points are to be noted-
Consistency - Solid, Semi-solid, Liquid etc.
Shape - Round, Conical, Triangular, Rectangular etc.
Colour - Red, Orange, Yellow etc.
Touch - Smooth, Rough etc.
Smell - Having Odour or Odourless etc.
Taste -Sweet, sour, bitter, salt, tastless etc.
In Ayurveda Rasa, Guna, Virya, Vipaka of the Prepared medicine should be alsoseen.
Chemical Analysis Of Prepared Medicine -Because Rasa-Aushadhies having toxic dravyas like mercury, Orpiment, Realgaretc. so these are tasted very carefully.
In chemical analysis following necessrary tests should be done –
1 -Determination of Moisture - The loss on drying determinesContent (Loss on Drying) the amount of volatile matter of any kind (including water)
2- - Determination of Ash content -Ash content indicate presenceof Inorganic Non-volatile material present in the medicine.

3- - Determination of acid Insoluble -Acid Insoluble substances show substances the presence of silica and other Insoluble materials present in the medicine.
4- - Determination of water – Watersoluble extractives shows soluble Extractives the presence of water.
5- - Determination of Carbon Carbon-di-sulpide solubility disulpide solubility shows the presence of free
6- - Determination of Heavy elements- Heavy elements Which are present in the medicine are detected by ASS (Atomic Absorption Spectroscopy) or ICP-MS (Inductively Coupled Plasma Mass Spectroscopy).By these techniques following elements are detcted- Hg, Cu, Zn, Pb, Co, As, Cd, Fe, Mn, etc.
In present study, after Kupi- Pakwa procedure, the prepared HingulioManikya Rasa should be tested physically and chemically by these procedures.

DISCUSSION

In the Rasa aushadhies, Mercury or Rasa texts said aushadhies contain Rasa aushadhies are very best in Qualities . Theyare used in very small amount and not cause any disrelish like decoction, powder, avaleha. Rasa aushadhies are fast in action.
Among the Rasa aushadhies, Kupi-Pakwa are superior. Kupi-Pakwa Rasayana formation is stared from 13 th century.
Acharya Shri Yashodhar give 1 st description of Kupi-Pakwa Rasayana in the form of Rasa Sindura Kalpana in his Rasa text
Rasa Prakash Sudhakar.
In the presented research work title “Hingulio Manikya Rasa Prayogatmaka Adhyayan” is prepared as per Rasa texts method and after formation its physio-chemical analysis is done. Hingulio Manikya Rasa description is found in the 9 th chapter “Hingul Vigyanio” of Rasa Tarangini. Three sample of Hingulio Manikya Rasa is made by the stick method. Main ingredients of Hingulio Manikya Rasa are Hingula, Gandhak & Haratal
Before making Hingulio Manikya Rasa its all ingredient are purified.
E. g.

- All the three sample of Hingula are purified, by the seven times grinding of Hingula with lemon juice.
- All the three sample of Gandhak are purified, by the cow’s milk and mustard oil.
- All the three sample of Hartal (Orpiment) are purified, in Dola Yantra contain lemon juice.

After purification of all the three raw material, is taken equal amount of 150 grams of each and placed in a mortar and palash puspa decoction is mixed. Now grinding of this mixture is for 7 days after grinding mixture is dried and filled in Kanch Kupi upto its 1/3 rd level of Kupi Pakwa nirmana, temperature is controlled with the help of Pyrometer. Heat is given in increasing order viz. Mridu, Madhyam, & Tivragani. During Mriduagni temperature was maintained upto 250^0C in Madhyam agni temperature was maintained between250^0C - 500^0C and Tivraagni temperature was maintained between 500^0C - 750^0C.
For establish the standardization of any medicine, minimum three samples should be made. So I have prepared the three sample of HingulioManikya Rasa by using a stick method. After formation analytical study is done of all the three samples.
In the present days Kupi Pakwa Rasayana formation is disappeared, due to its formation process is very expansive and requires very hard labor. During formation of Kupi Pakwa, it sealing of mouth of Kanch Kupi is not done at proper time, mercury will be evaporated and very small amount of medicine will obtained. There is lot more precaution during Kupi Pakwa nirmana that should be care off other wise proper medicine will not formed. By keeping the curiosity in above said thoughts about Kupi Pakwa, I have selected this challenging topic of Hingulio Manikya Rasa. Hingulio Manikya Rasa has very important place in the Kupi Pakwa Rasayana.

RESULT

Rasa Shatra and Bhaishjya Kalpana has a very important place in Ayurveda. In the Rasa Shastra complete knowledge of medicine preparation is found. Rasa Aushadhies are the back bone of the Ayurvedic system of medicine. The Rasa aushadhies are administered in very small dose, not causing disrelish and given quicker relief. They having longer durability and enhance properties of many drug. Among the Rasa Aushadhies Kupi

Pakwa Rasa hold the Top places, the effect of these Kupi Pakwa Rasa are really a miracle. Their efficacy is good if they are prepared by proper procedure.
HingulioManikya Rasa is a Kupi Pakwa Rasayana. Its description is found in Rasa Tarangini. Rasa Tarangini is a complete Rasa text. It contain arranged description of Rasa Dravyas, their synonyms and their Aramaic use.The topic Hingulio Manikya Rasa is selected from the 9 th Chapter (HingulViganio) of Rasa Tarngini. In the presented research work, the result is divided into two categories.
A) Result of formation study.
B) Result of Physico-chemical analysis.
A) Result of formation study :The main content of HinguioManikya Rasa are as follows :-
a) Hingula
b) Gandhak
c) Hartal
Results of their purification are give in the following table-
Table No 1 Hingula

Sample No	Wt before shodhan (in grams)	Wt after shodhan (in grams)
1	500	486
2	500	491
3	500	485

Table No 2 Gandhaka

Sample No	Wt before shodhan (in grams)	Wt after shodhan (in grams)
1	500	482.2
2	500	480.5
3	500	485.0

Table No 3 Hartal

Sample No	Wt before shodhan (in grams)	Wt after shodhan (in grams)
1	500	498
2	500	497
3	500	497

After purification we have taken 150 mg materials from each (Hingul, Gandhak, & Hartal), then all the three materials and palash decoction is mixed and grinding is done for 7 days. After grinding mingles is dried in sun light and 350 mg of this stuff is filled into Kanch Kupi and heating is done with the help of Baluka yantra. The entire three samples are prepared by stick method. During heating three type of Agni is specified in order of Mridu, Madhyam and Tivra .
Table No 4

Sample No	Mridu Agni (^{0}c)		Madhya Agni (^{0}c)		Tivra Agni(^{0}c)	
	Min	max	Min	max	Min	max
1	65	250	285	520	560	750
2	50	255	270	510	550	750
3	60	251	290	500	540	751

After heating Baluka Yantra is left for self-cooling. Baluka yantra takes 24 hour in self cooling. After self-cooling Kanch Kupi is broken down and medicine is detached from the bottle and weight up, and held in reserve in an air tight container.
Obtained weight of all three samples of Hingulio-Manikya Rasa are as follow:

Table No 5

Sample No	Wt of raw shodhan (in grams)	Wt of obtained medicine at the neck of bottle(in gms)	Loss (%)
1	350	165	52.85
2	350	168	52.00
3	350	170	51.42

B) Result of Physico-chemical analysis:
After formation of Hingulio Manikya Rasa, physical-chemical analysis is done and subsequent result are obtained.
Physical-chemical analysis of Hingulio Manikya Rasa
1- Physical Analysis :
a) Consistency- Solid
b) Shape – Conical (before grind)
c) Color – Shining red with metallic luster (after grind)
d) Smell – like it contents (esp. smell like sulphur)
e) Taste – Tasteless
f) Touch – Fine
2- Determination of moisture content (loss of Drying):

Sample no	Avg % LOD
1	0.34
2	0.50
3	0.65

3- Determination of ash content :

Sample no	Avg % of ash content
1	0.256
2	3.33
3	1.27

4- Acid insoluble substances :

Sample no	Avg % of acid insoluble ash
1	97.24
2	96.24
3	95.04

5- Water soluble extractives :

Sample no	Avg % of water soluble extractives
1	0.584
2	0.840
3	0.635

6- Carbon disulphide solubility :

Sample no	Avg % of carbon disulfide solubility
1	6.07
2	3.13
3	13.93

7- Estimation of Mercury :

Sample no	Avg % of mercury
1	48.68
2	25.29
3	35.51

Summary

A brief summary of all segments are discussed here.

1- Introduction : In introduction, the importance of Rasa and Rasa Shastra is described. Three types of Chikitsa and Chikitsaka are defined. History of Kupi-Pakwa Rasayana and its classification is described.

2- Historical Review of Hingulio ManikyaRasa : The ingredients of Hingulio Manikya Rasa are described inVedas, Puranas, and Samhitas. The development of Rasa Shastra is divided in to 4 parts

a) Prachina Kala

b) Madhya Kala

c) Praudi Kala

d) Adhunika Kala

The description of Hingulio Manikya Rasa is found in Rasa Tarangini, which is a text of adhunika Rasa Shastra Kala.

c) Description of Kupi Pakwa Rasayana: In this segment formation procedure of Hingulio Manikya Rasa is described. Whole procedure is divided into 3 categories

1- Pre Preparative process

2- Main process

3- After words process

4-Experimental Section : It is divided into 2 parts

a) Pharmaceutical study- In this segment formation process of Hingulio Manikya Rasa is described. After purification of Hingula Gandhaka and Hartal, raw material is formed with Palash Puspa Decoction. This raw material is filled in Kanch Kupi and after that Kupi Pakwa procedure is done. After Kupi Pakwa procedure, prepared Hingulio Manikya[(6)] is collected from neck region of the Kanch Kupi.

b) Physico-chemical analysis- After preparing Hingulio Manikya Rasa, it is tested by physically and chemically. In physical examination consistency, colour, odour, taste and touch is seen. In chemical examination loss of drying, ash content, acid insoluble substances, water soluble extractives carbon-di-sulphide solubility and estimation of heavy element is done.

5-Discussion : This research topic is been selected by taking the curiosity in Kupi Pakwa Rasa aushadhies. In this segment, superiority of Kupi Pakwa Rasayana among the Rasaushadhies is defined.

6-Result : Result of weight loss of Hingula, Gandhaka and Hartal, during their purification process are given. Obtained weight of all the three sample of Hingulio Manikya Rasa are given. Obtained data's of physicochemical analysis are also given.

In the summary, a brief description from Introduction to result is given.

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