

PREPARATION AND STANDARDIZATION OF MADANODAYA RASA WITH SPECIAL REFERENCE TO RASAMANJARI**Dr. Aatiq Iqbalahamad Momin^{*1} and Dr. Swati Patil² and Dr. Asif Momin³**¹BAMS, MD- Ayurveda Ras Shastra Bhaishajya Kalpana, Ashvin Rural Ayurved College Manchi Hill Sangamner Maharashtra India, Assistant Professor in Department of Ras Shastra Bhaishajya Kalpana.²BAMS, MD- Ayurveda Ras Shastra Bhaishajya Kalpana, YAC Kodoli College Kolhapur Maharashtra, Associate Professor in Department of Ras Shastra & B. K.³BAMS, MD-Ayurveda Ras Shastra Bhaishajya Kalpana, Taluka Shikshan Prasarak Mandalis Ayyurveda Medical College Sindagi Dist. Vijapur State Karnatak India, Assistant Professor in Department of Ras Shastra & B.K.***Corresponding Author: Dr. Aatiq Iqbalahamad Momin**

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ABSTRACT

Background & objectives: Standardization of ayurvedic drugs is a difficult task because majority of ayurvedic formulations have complex materials of natural origin. However, we must evolve some simple quality control methods for their standardization. MadanodayaRasa is a KupipakwaRasayana. It is prepared in specially designed glass bottle by gradual heating immersion in sand bath (ValukaYantra). MadanodayaRasa has shuddhaparad and shuddhaGandhaka as ingredient and kamalpushpaswaras as bhavnadravya. **Aim:** To study preparation and standardization of Madanodaya Rasa with special reference to Rasamanjari. **Objectives:** 1.To study process of shodhana of Parada. 2.To study process of shodhana of Gandhaka.3.To study preparation of Raktotpal swaras and its effect as bhavana dravya. 4.To prepare Madanodaya Rasa with special reference to Rasamanjari. 5.To standardize Madanodaya Rasa. **Material and Method:** Raw parada gandhaka raktotpala and other drugs required for shodhana like rasona ,saindhava lavana godughda goghrita, etc were collected.these drugs get authenticated. Madanodaya rasa were obtained by Kupipakwa rasayana procedure. 175 gms kajjali was used in all batches each. **Results:** Yield obtained is 60 gms in batch A, 60.2 gms in batch B and 60.4 gms in batch C. **Discussion and Conclusion:** - The time took for madanodaya rasa is 24 hours to prepare. In this procedure madhyamagni given for 17 hours.

KEYWORDS: Parad, Gandhak, Raktotpal swaras.**INTRODUCTION**

Ayurveda stems from ancient vedic culture and was taught for many thousands of years in an oral tradition from accomplished masters to their disciples. Rasashastra means Ayurvedic Pharmaceutics and as such it deals with drug of mineral origin. With the art and skill of formulation a poisonous drug can be transmitted into a safe and effective drug. A simple drug can be converted into a most potent one. Inkupipakwarasayana processes Parada has been used extensively to bring about the desired chemical changes in the final product. The other element used freely is Gandhaka. Madanodaya Rasa is a KupipakwaRasayana. It is prepared in specially designed glass bottle by gradual heating immersion in sand bath (ValukaYantra). MadanodayaRasa has shuddhaparad and shuddhaGandhaka as ingredient and kamalpushpaswaras as bhavnadravya.

In Rasashastra there are so many methods for drugs formulations like kharliya rasayana, kupipakwa rasayana,

bhasma pottali parpati etc. in every drug formation acharya has given particular test for standard product preparation. The quality of finished product refers to the intrinsic value of drug and purity means absence of adulteration. The screening of finished products under standard parameters by adopting suitable analytical methods may be sufficient to rule out any adulteration.

Parada vernacular names^[1]

- English- mercury, Quick silver
- Gujarati- paro
- Hindi- para
- Kannada- padarasa
- Marathi para
- Sanskrit- parada, rasa

Parada shodhana**Samanya shodhana of parada**

Name of text	Method
A.P.1/165-169 ²	with rasona and lavana in tapta khalwa yantra
R.T.5/27-29 ³	with sudha,rasona,lavana
R.T.5/34-35 ⁴	with nagvelli rasa,adraka rasa and trikshara

Physical properties OF MERCURY (Hg)

English name	–	Quick silver
Latin name	-	Hydragyrum
Symbol	-	Hg
Colour	-	Shining silver white
Atomic NO	-	80
Valency	-	1-2
Atomic weight	-	200.61
Specific gravity	-	13.595 at 25 °C
Boiling point	-	357 °C
Freezing point	-	-39 °C

Physical properties of Gandhaka (sulphur)

Hardness	–	1.5 to 2.5
Melting point	–	119 ⁰ C
Boiling point	-	444.8 ⁰ C
Specific gravity	–	1.9 to 2.1
Atomic weight	–	32.066
Atomic no.	-	16

RAKTA UTPALASynonymes and Family^[5]

Family	: Nymphoeaceae.
Latinname	: Nymphaea rubra Roxb.
Sanskrit name	: Rakta utpala
English name	: Indian red water lily.
Hindi name	: Lal koi
Bangali name	: Kumud
Marathi name	: Kamod
Gujarati name	: Poyanu
Tamil name	: Alli – tamarai
Telagu name	: Alli – tamar
Kannada name	: Nipadale huwu
Mallyalam name	: Periyamble
Chemical composition	illustrated d.g. vol 2 dr.j.l.n. sastry chauhambha
Flowers :-	nymphalin (glucoside),quercetin, kaemferol etc.
Roots :-	luteolin

CONCEPT OF KUPIPAKWA METHOD**Definition**

Shudha parada and Shudha Gandhaka or without Gandhaka alone or in combination, triturated with other uparasa dravyas or metals like swarna etc. without adding any liquid so that it will convert into a fine smooth blackish (looking like kajjala- collyrium) or ash like powder by proper trituration is known as kajjali.it should be free from any shining or lusturous particles.

Importance of kupipakwa rasayana

- Potency of these drugs remains as it is for longer period.

- It requires minimal dose.
- Easy for administration.
- More potent as compared to other pure herbal preparations.
- When mixed with other drugs, it reduces the dose of other drugs.
- Due to its augmenting effect.
- Due to its quicker action.

Chemical bonding becomes stronger and stronger in following order- Kajjali, parpati, pottali, and kupipakwa rasayana.

Significance is to introduce properties of gandhaka into parada and to create a special medicinal compound.

PROCEDURE: The whole procedure of kupipakwa rasayana as follows:

1. Purva karma
2. Pradhana karma
3. Paschat karma

AIM AND OBJECTIVES**Aim**

To study preparation and standardization of Madanodaya Rasa with special reference to Rasamanjari.^[6]

Objectives

1. To study process of shodhana of Parada.
2. To study process of shodhana of Gandhaka.
3. To study preparation of Raktotpal swaras and its effect as bhavana dravya.
4. To prepare Madanodaya Rasa with special reference to Rasamanjari.
5. To standardize Madanodaya Rasa.

MATERIAL AND METHOD**Concept of kajjali (Rasaratna samuchchaya- 8/5)^[7]**

Synonyms: Kajjali, Kajjalika, Kajjala

Definition

Shudha parada and Shudha Gandhaka or without Gandhaka alone or in combination, triturated with other uparasa dravyas or metals like swarna etc. without adding any liquid so that it will convert into a fine smooth blackish (looking like kajjala- collyrium) or ash like powder by proper trituration is known as kajjali.it should be free from any shining or lusturous particles.

KRAMAGNI pattern categorized in three stages

Mrudu agni –	125 – 250 ⁰ C (Initial stage)
Madhyamagni-	250- 450 ⁰ C (Middle stage)
Tivragni -	450- 650 ⁰ C (End stage)

The study was conducted under the following steps

- Collection of raw parada, gandhaka raktotpala and other drugs required for shodhana like rasona saindhava lavana godughda, goghrita, etc.
- Getting authenticated these raw drugs.
- Shodhana of raw drugs parada and gandhaka
- Mardana for kajjali.
- Bhavana of raktotpala pushpa swarasa to the kajjali
- Half part of samabhaga gandhaka added to kajjali.
- Again bhavana of raktotpala pushpa swaras to the kajjali.
- Kupipakwa rasayana procedure to obtain madanodaya rasa.
- Preparation of Madanodaya rasa in three different batches.
- Standardization of madanodaya rasa

Equipment used for preparation of Madanodaya rasa

- Tapta khalwa yantra
- Khalwa yantra
- Loha kadhai, Valuka yantra
- Sand
- Kach kupi
- Pyrometer
- Trays & spatula
- Loha shalaka
- Brick –cork
- Knife
- Cloth
- Clay
- Match box
- Torch
- Kerosene
- Procelin mortar with pestle
- Weighing machine

Procedure of filling kajjali in kupi

- 1/3rd of kupi was filled with kajjali.
- 2/3rd space was kept vacant for further chemical reactions which were occurs in kupi.
- Kajjali was filled in bottle likely to be occur of small spatula.
- Quantity of kajjali was filled in bottle was 175 gms.
- One white paper was kept beneath the bottles to collect the kajjali in case of spillage while filling.

Procedure of madanodaya rasa preparation

- In this step madanodaya rasa was prepared through valuka yantra on kramagni pattern with the help of big gas burner.
- Heat was given for 24 hrs continuously.
- Temperature was recorded half hourly.
- During procedure sulphur fumes(yellow in colour) and flames (blue in colour) were coming out from the mouth of kupi
- When yellow fumes and blue flames coming out tapta shalaka sanchalana was done.
- When the yellow fumes and blue flames decreased then copper coin test were carried out.

- Copper coin test was positive and bottom of kupi was look like red colour of dawn.
- Process of closing of mouth of the bottle is called mudrana.
- After getting above paka lakshana it was immediately applied to the mouth of kupi.
- A piece of chalk is covered with multani mitti and matakapad fitted on mouth of kupi.
- Mudrana was done and last for 3 hrs tivragni was given.

Heating procedure and temperature pattern

Deepagni stage: In this stage only valuka yantra was heated for 2 hrs.

Manda agni

- Greyish fumes were started coming out from mouth of kupi in this stage.
- The temperature of the sand was 235⁰ C to 323⁰ C for 2 hrs.
- Kajjali paka was in process in this stage.

Observation noted down**Madhyama agni**

- The temperature of sand in this stage was 324⁰ C to 502⁰ C for 17 hrs.
- Madhyama agni was maintained until the yellow fumes was disappeared.
- In this stage tapta shalaka sanchalana was done.
- The bottom of the kupi becomes like red colour of dawn.
- Copper coin test was positive.
- When blue flames disappeared then corking of mouth of kupi was done.

Tivra agni

- In this stage the formed compound accumulated at the neck of the bottle by urdhwapatana i.e. sublimation, before this stage fumes should be subsidized completely.
- Temperature of 503⁰ C to 610⁰ C was maintained for 3 hours.
- After proper siddhi lakshana of madanodaya rasa corking was done and tivragni was provided.

Self-cooling phase

- Self-cooling for 18 hrs and then bottle was removed on next day.

Breaking process of kupi

- Coating of kupis scraped off by a knife
- The position of final product stuck at kupi neck can be seen.
- According to position one finger below the lower border of final product, a thread was dipped in kerosene, tied and ignited.
- After complete burning of thread the heated portion of kupis were covered with wet cloth. When the breaking sound heard, cloth was removed.
- The kupi holded in big tray while breaking.

- Madanodaya rasa was red coloured and crystalline in nature. It is collected by hammering the kupi by wooden rod.

Material & Methods

Parada Shodhana

Ingredients



Ashudha Parada



Nistusha Rasona



Saindhav lavana



Rasona Kalka



Parada mixed in Rasona kalka



Shodhita Parada

Preparation of Kajjali

Ingredients



Shudha Parada



Shudha Gandhaka



Mixing Parada with Gandhaka



Trituration procedure



Kajjali

Test for kajjali



Adding ½ part of Gandhaka

Adding Raktotpal pushp
Swarasa – 2nd Bhavana

Preparation of Madanodaya Rasa



Filling Kachakupi



Preparation of Valuka Yantra



Fixing the Kupi



Valuka yantra

OBSERVATION AND RESULT

Under this caption observations and results of Madanodaya rasa preparation with special reference to rasamanjari were enlisted. The procedural observation along with results and analytical observations and results of final product are also mentioned.

A) Observation and Results of Pharmaceutical Study**1. Parada shodhana****Observation**

- Before shodhana: parada was shiny with blackish grey coloured.
- During shodhana: ← when parada triturated with garlic paste and saindhava lavana, colour of paste turns from yellow to light grey.
- After complete trituration garlic paste was greenish black.
- Burning and lacrimation of eyes observed during trituration may be due to presence of organic sulphur in rasona.
- In 1st week parada was adherent to paste in minute particles.
- In 2nd week the paste was hard and parada was separated from it.
- In 3rd week paste turn from hard form to powdered form and parada was separated from it.
- In 4th week it was totally powdered form and parada was separated silvery and shiny.

Result

- Total amount taken – 500 gms
- Total amount gained – 450 gms
- Total weight loss – 50 gms

2. Gandhaka Shodhana**Observation**

- Before shodhana: Gandhaka was in powder form.
- During shodhana: When gandhaka was melted in goghrita some impurities float on upper surface of melted gandhaka.
- When melted gandhaka was poured in godugdha, filtered it by cotton cloth the impuritie which were floating, they removed.
- After that at the bottom of the vessel the gandhaka was collected in one piece. which was stoney hard.
- Gandhaka was removed from vessel and washed by warm water.
- Again fine powder of gandhaka made in khalwa yantra and repeated above method twice again.
- After every shodhana impurities of gandhaka was removed and gandhaka get cleaned after third procedure.

RESULT

- Weight of ashuddha gandhaka taken – 500 gms
- Weight of gandhaka obtained - 450 gms
- Weight loss - 50 gms

3. Preparation Of Kajjali

- During first day when parada and gandhaka mixing together in khalwa yantra it was taken one hour to get blackish colour.
- kajjali take 8 days, daily 8 hours to get nishchandrata.

4. Preparation of Kajjali For Madanodaya Rasa

- First raktotpal swarasa prepared and added in samabhaga kajjali And bhavana given.
- After kajjali completely dried by trituration, again half part of gandhaka added(half quantity of sambhaga gandhaka)
- Trituration done for 8 days, daily 6 hours.
- After that again raktotpal swarasa bhavana given to kajjali.
- Trituration done til kajjali gets dry.

Preparation of Madanodaya Rasa Batch –A**Observation**

- In this kajjali, parada was taken 1 part and gandhaka was taken 1 ½ part.
 - Two times raktotpal pushpa swarasa bhavana given.
- Result:
- Total kajjali taken – 175 gm
 - Final product obtained –kanthastha – 60 gm
Talastha - 35 gm
 - Yield in % - 34.2 %

Preparation of Madanodaya Rasa Batch – B**Observation**

- Kupi B prepared in 24 hours.
- In this kajjali, parada was taken 1 part and gandhaka was taken 1 ½ part.
- Two times raktotpal pushpa swaras bhavana given.

Result

- Total kajjali taken – 175 gm
- Final product obtained –kanthastha – 60.2 gm
- Talastha - 35.6 gm
- Yield in % - 34.4 %

Preparation of Madanodaya Rasa Batch - C**Observation**

- Kupi C prepared in 24 hours.
- In this kajjali, parada was taken 1 part and gandhaka was taken 1 ½ part.
- Two times raktotpal pushpa swaras bhavana given.

Result

- Total kajjali taken – 175 gm
- Final product obtained –kanthastha – 60.4 gm
- Talastha - 34.5 gm

Yield in % - 34.5 %

Analytical Results**Table Showing Analysis of Madanodaya Rasa.**

Test	Batch A	Batch B	Batch C
Description	Orange colored fine powder	Orange colored fine powder	Orange colored fine powder
Colour	Orange	Orange	Orange
Odour	Pungent	Pungent	Pungent
Taste	Characteristics	Characteristics	Characteristics

Table Showing Analytical tests of Madanodaya Rasa.

Test	Batch A	Batch B	Batch C	Average
Total Ash	01.72	01.00	01.80	01.50
Acid Insoluble Ash	00.01	00.04	00.01	00.02
Water Soluble Ash	01.55	00.56	01.52	01.21
Alcohol Soluble Ash	Nil	Nil	Nil	Nil
Partical Size	11.3	10.8	10.2	10.76
pH	08.06	07.80	07.97	07.94

Table Showing Average Yield of Madanodaya Rasa.

Madanodaya Rasa	Total kajjali taken	Final product obtained		Yield in %
		kanthastha	Talastha	
Batch - A	175 gm	60 gm	35 gm	34.2 %
Batch - B	175 gm	60.2 gm	35.5 gm	34.4 %
Batch - C	175 gm	60.4 gm	34.5 gm	34.5 %
Average				34.3 %

XRF Analysis of Madanoday Rasa.

Element	Unit	Batch A	Batch B	Batch C	Average
Sulphur	cps	27785	28348	28388	28173
Calcium	cps	59.3	56.3	55.9	57.16
Iron	cps	211.1	210.3	195.7	205.7
Mercury	cps	57312	56853	57412	57192

DISCUSSION

The important points covered under conducted study are discussed below:

- Literary review
- Pharmaceutical review
- Analytical review

Literary review**Parada**

- Parada is very important content in preparation of rasaaushadhis.
- Mercury is given importance in literary documents for safety profile processing and making it more organic and acceptable. It is also reviewed for its oxidative effect nutritive effect etc.

GANDHAKA

Gandhaka is important for making kajjali. parada and gandhaka containing kajjali mostly used in kharliya rasayana as well as kupipakwa rasayanas.

RAKTOTPALA

- It should be used freshly collected to avoid more physical impurities.
- Once wash it with tap water is sufficient to remove minor impurities.

KUPIPAKWA METHOD

- Madanodaya rasa prepared by this method is sa agni sagandha bahirdhuma kupipakwa rasayana.
- In literature it is mentioned that earthen pot should be used but practically it is not possible to sustain to higher temperature.
- Instead of this we can use the iron vessel for better pachana of drug in kupi.
- Kacha kupi has been prepared by smearing 7 layers of muddy cloth over it without allowing any air bubble through the procedure, as expanded air creates an internal pressure between kupi and kapadmitti. it can lead to breakage of bottle and spillage of kajjali.
- Kramagni is another factor which has to be go from one stage to another according to the stages seen in the kupi with the help of torch.

PHARMACEUTICAL REVIEW**Parada shodhana**

- It was done as per Ayurveda prakasha 1/165.
- After mardana with rasona kalka and saindhava lavana the colour of paste turned to grey.
- During trituration of parada with rasona and saindhava lavana burning and lacrimation of eyes

was observed may be due to presence of organic sulphur tikshnagandhi rasona.

- After washing with warm water mercury became blemish less, shiny spotless and lustrous.
- Saindhava lavana having kshariya properties, it dissociate the molecule of parada at the same time it may possible that due to presence of organic sulphur in rasona, parada may bind with it and leave remaining dosha in rasona saindhava kalka.

Gandhaka shodhana

- It was done as per rasatarangini 8/7-12.
- After heating the gandhaka in goghrita, gandhaka starts melting.
- After few minutes it was melted completely and became liquid.
- Impurities of gandhaka was floating on surface of liquefied gandhaka.
- After wastra gal in godugdha the impurities remain on cloth and purified gandhaka was store at the bottom of godugdha containing vessel.
- Gandhaka was washed with warm water, because of that the smell of goghrita and godugdha in gandhaka reduced.

PREPARATION OF KACHA KUPI

- The amber coloured bottles are having more pyro sensitivity and hence it was selected.
- Kupi was covered with 7 layers of multani mitti smeared cloth.
- After complete drying of previous layer next layer applied.
- Air space between the layers may cause breakage of kupi dduring heating.
- Application of matakapad strengthens the kupi and helps in regulate temperature inside kupi to facilitate the chemical reaction.

PLACING OF KUPI IN VALUKA YANTRA

- Over the central hole of valuka yantra abhraka patra was placed, which acts as heat resistant and helps steady rise in temperature.
- Valuka is maintain uniform and sustained heat to kupi and support kupi during procedure.

Importance of kramagni

- The kramagni is recommended to give uniform slow and steady rise in temperature.
- The kramagni given the ingredients enough time at each range of temperature for any kind of reaction take place.

Corking procedure

- The corking prevent the loss of mercury and other drugs by evaporation.
- It may possible white fumes may come out through sandhi bandhana in between mudra and bottle.

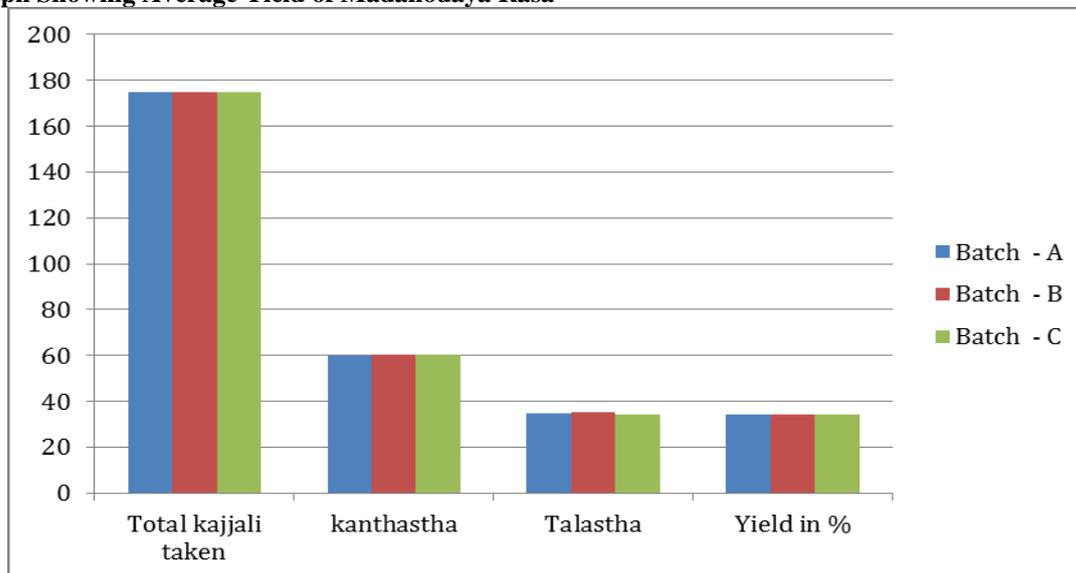
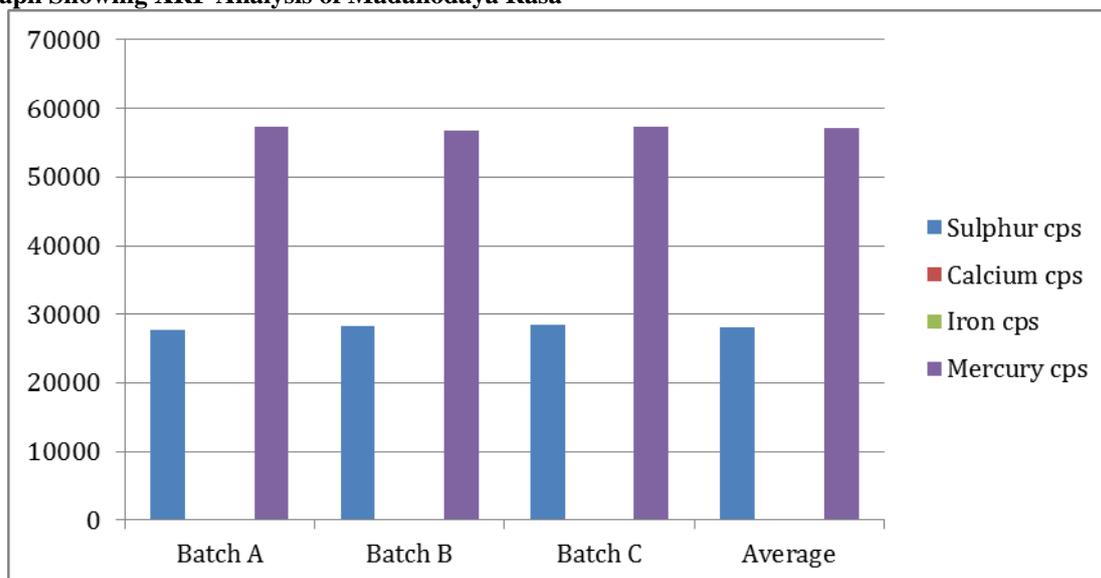
Tivragni

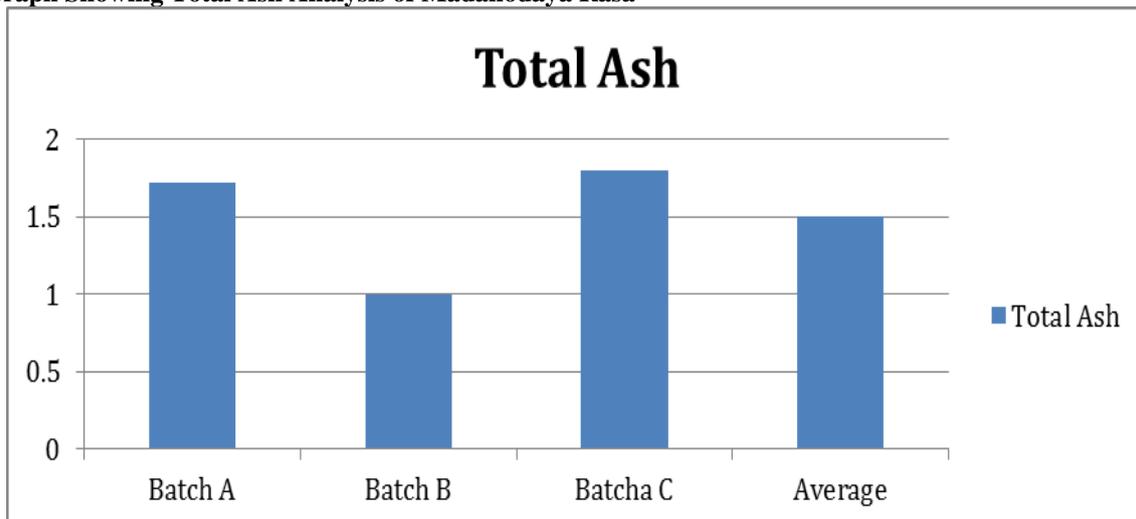
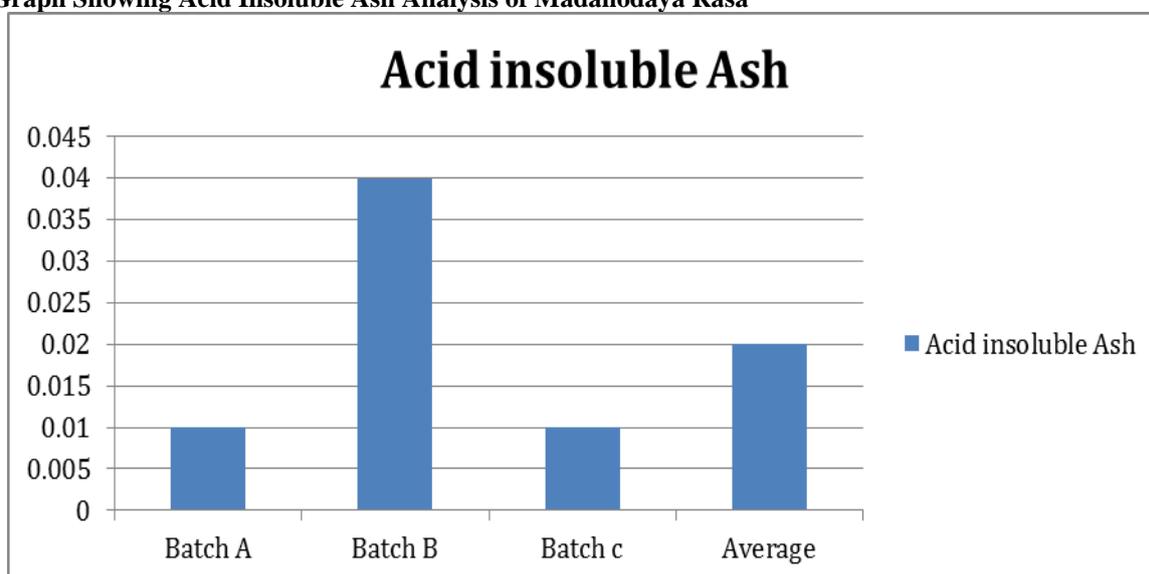
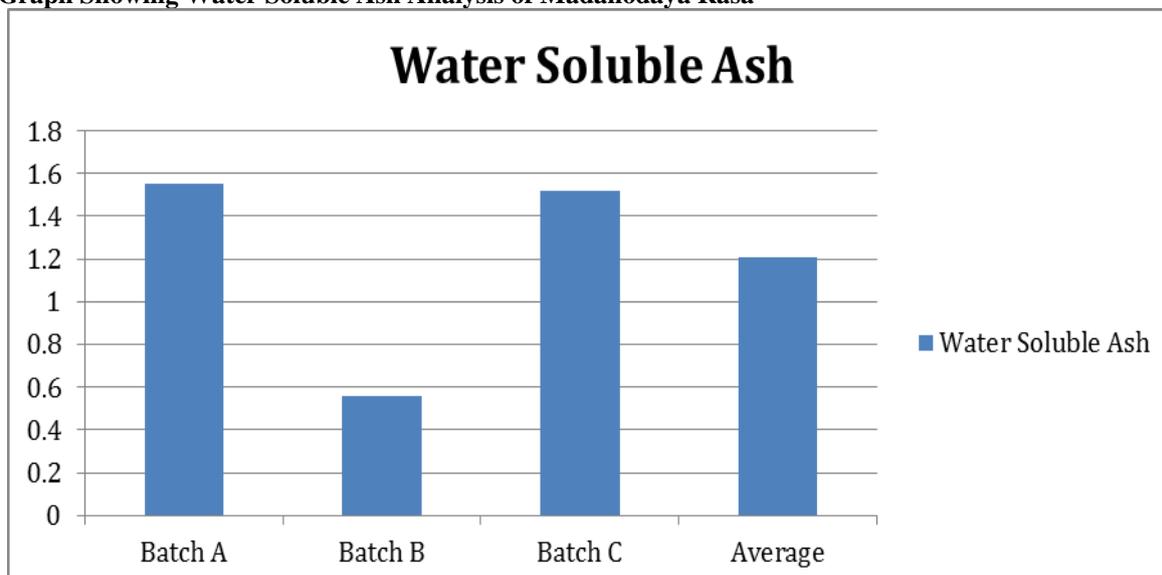
- Tivragni had been given after corking.
- Tivragni helps mercury to evaporate more and yield will be more.
- It should not be extended as mercury can be in its original form again.

The whole process of Madanodaya Rasa preparation was done with special reference to Rasamanjari.

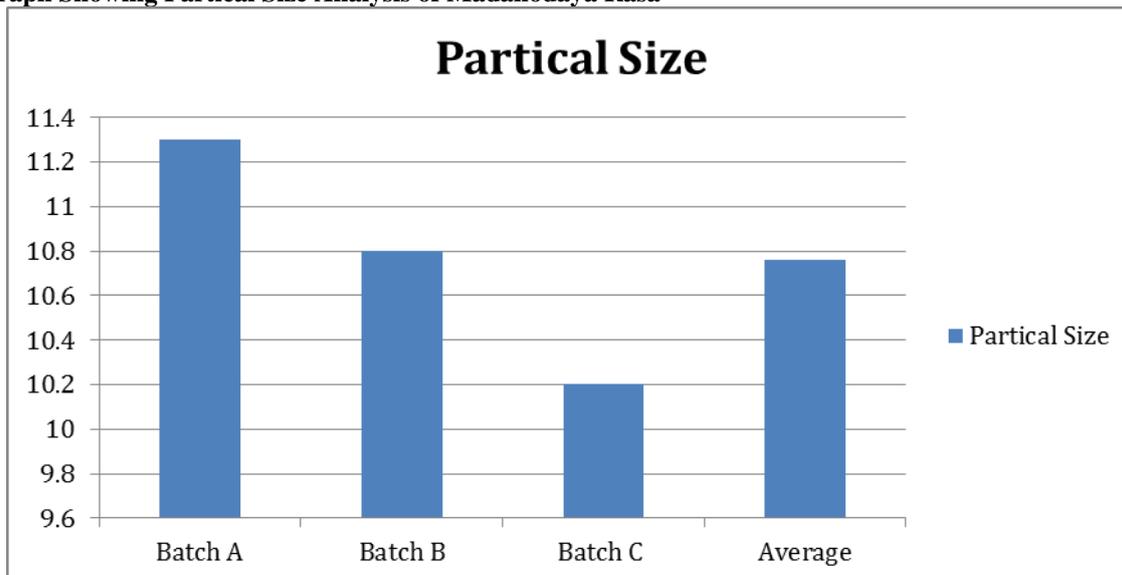
RESULTS

- average values of madanodaya rasa as follows,
 - The total ash average 1.50.
 - Acid insoluble ash 00.02.
 - Water soluble ash 1.21.
 - Alcohol soluble ash nil.
 - Partical size 10.76.
 - pH 0.94.
 - XRF – sulphur 28173, calcium 57.16, Iron 205.7, Mercury 57192.
 - Yield – 34.3%.
 - Loss on drying 4.69

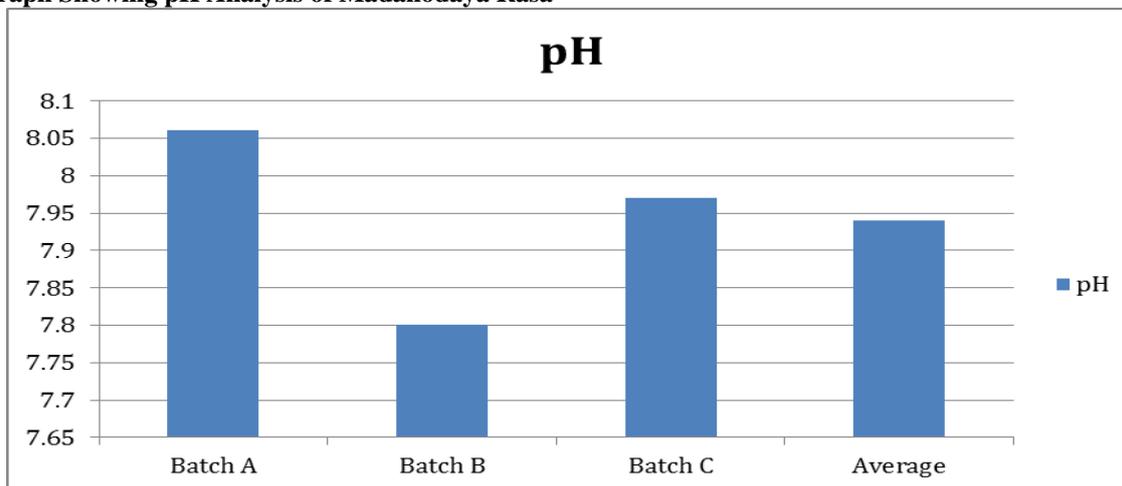
Graphs**(Stastical Representation)****1. Graph Showing Average Yield of Madanodaya Rasa****2. Graph Showing XRF Analysis of Madanodaya Rasa**

3. Graph Showing Total Ash Analysis of Madanodaya Rasa**4. Graph Showing Acid Insoluble Ash Analysis of Madanodaya Rasa****5. Graph Showing Water Soluble Ash Analysis of Madanodaya Rasa**

6. Graph Showing Partical Size Analysis of Madanodaya Rasa



7. Graph Showing pH Analysis of Madanodaya Rasa



CONCLUSION

- Madanodaya rasa was prepared in 3 batches.
- The time duration for preparation of madanodaya rasa was 24 hours for each single batch.
- Mandagni, Madhyamagni and Tivragni given.
- Madhyamagni given for 17 hours and maintain the temp between 324⁰ C to 502⁰ C.
- The reason for 17 hours madhyamagni because of burning of gandhaka.
- It can be standardized by these average analytical values of madanodaya rasa prepared in three different batches.
- The yield of madanodaya rasa was 34.3%.
- XRF average value was sulphur 28173, calcium 57.16, Iron 205.7, Mercury 57192.

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