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Pharmaceutico-Analytical Study of Poornachandrodaya Sindoora- A Kupi Pakwa Rasayana

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Abstract: ***Rasashastra, the pharmaceutical branch of Ayurveda, deals with the processing of metals and minerals for therapeutic use. Poornachandrodaya Sindoora is a Sagandha, Saagni, Kantastha Bahirdhooma Kupipakwa Rasayana described in Rasayoga Sagara, indicated in Pancha Chardi, Kasa, Hridroga, Aruchi, Swarabhanga, and Mandagni. The present study aimed to prepare Poornachandrodaya Sindoora according to classical references with proper SOP and to evaluate its Pharmaceutico-analytical parameters.***

Shodhana of Parada and Gandhaka was carried out using classical methods, followed by preparation of Kajjali and Bhavana with Kapittha Moola Kashaya for three days. The formulation was prepared by the classical Kupipaka technique, followed by Bhavana with Kapittha and Bilwa Moola Kashaya and addition of fine powders of Twak, Ela, Patra, Nagakeshara, Karpura, and Lavanga. Analytical evaluation was performed using physicochemical tests, XRD, SEM-EDX, FTIR, particle size analysis, and NPST.

Poornachandrodaya Sindoora exhibited a characteristic red colour with an alkaline pH of 9.23 ± 0.10. XRD analysis revealed trigonal crystal system of HgS and orthorhombic crystal system of sulphur. SEM-EDS confirmed the presence of K, O, Hg, and C. FTIR analysis indicated hydroxyl, amine, aliphatic and aromatic functional groups. The mean particle size was found to be 625 nm, and NPST findings were consistent with classical standards

Keywords: Poornachandrodaya sindoora, Kupipakwa rasayana, Parada, Gandhaka, Kapittha moola kashaya, Bilwa moola kashaya, Hridroga.

I. INTRODUCTION

The quality and therapeutic reliability of pharmaceutical formulations depend not only on precision in manufacturing but also on the accurate identification, authentication, and systematic processing of raw materials. Classical *Ayurvedic* texts provide detailed descriptions of purification, detoxification, and incineration procedures specifically designed to transform metals and minerals into safe and efficacious therapeutic agents. These meticulously executed processes bring about essential physicochemical modifications that enhance bioavailability, stability, and therapeutic potency, thereby ensuring the safety, efficacy, and consistency of herbal and mineral formulations.

Poornachandrodaya Sindoora[1,2,3] is a unique *Kupipakwa Rasayana*, which is *Saagni, Sagandha, Bahirdhooma, and Kantastha*, containing Shuddha Parada and Shuddha Gandhaka as the main ingredients. It is enhanced by *Bhavana*[7] dravyas like Kapittha moola kashaya and Bilwa moola kashaya, along with addition of fine powders of *Twak, Ela, Patra, Nagakeshara, Karpura, and Lavanga,* which further enhance the therapeutic effects of the formulation. As it contains ingredients with *Deepana, Kaphahara, Chedana, and Lekhana* properties, this yoga is indicated in *Pancha Chardi, Pancha Kasa, Hridroga, Aruchi, Swarabhanga, and Mandagni*.

II. AIMS AND OBJECTIVES

A. Aim of the study

To prepare *Poornachandrodaya sindoora* and to carry out its Pharmaceutico Analytical study.

B. Objective of the Study

- To compile classical references about *Poornachandrodaya sindoora* and critically discuss them
- Preparation of *Poornachandrodaya sindoora* as per classical reference.
- To carry out Physico-chemical analysis of *Poornachandrodaya sindoora.*

III. METHODOLOGY

1) Raw drugs which were having similar *Grahya lakshanas* as mentioned in the Rasa classical texts, were collected from the market.

2) Extraction of Parada from *Hingula*[4] by subjecting it to Urdhwapatana vidhi.

3) *Parada*[5] was done shodhana with *Haridra churna* and did mardana for 24 hours then filtered through four folded cloth.

4) *Shodhana of Gandhaka* was carried out in Godugdha by subjecting it to Kurma puta by Bhoodhara yantra method.

5) *Samaguna Kajjali* was prepared by Mardana of 250 g each of *Shoditha Parada and Shoditha Gandhaka*[6] for 210 hours.

6) *Kajjali*[8] was given Bhavana with *Kapittha moola kashaya* for 3 days until subhavitha lakshana was attained. After 3rd day of bhavana vati were rolled in total 264 vatis were prepared and allowed to dry.

7) Preparation of *Kupi*, i.e. amber coloured glass bottle was wrapped with 7 layers of Multani mitti smeared cloth and dried completely.

8) From this, 264 pills prepared, of which about 262 g (230 Vatis in no.) were filled in kupi bottle and subjected to *Kupipaka,* yielding 149 g of product prepared by *Kupipaka method* for 55 hours according to classics, Kramagni was maintained for whole procedure.

9) Approximately 50 g of the Kupi product was taken in a Khalva Yantra, powdered, and subjected to Bhavana with Kapittha Moola Kashaya and Bilwa Moola Kashaya for three days each.

10) After Bhavana, 30 g of the *Bhavitha Kupi product* was taken and mixed with 15 g each of finely powdered *Twak, Ela, Patra, Nagakeshara, Karpura, and Lavanga*, triturated to a homogeneous mixture to obtain the final product — *Poornachandrodaya Sindoora.*

IV. RESULTS

The results of Pharmaceutico-Analytical study of *Poornachandrodaya sindoora* are described under 2 headings. 1. Pharmaceutical results 2. Analytical results

A. Pharmaceutical Results

Showing results from Hingulottha Parada

Batch	Wt of Hingula taken for Urdhwapatana	Wt of Parada obtained	Yield in %
Batch I	209gm	138gm	66.02%
Batch II	209gm	141gm	67.46%

Showing results from Churnikarana of Haridra for shodhana of Hingulottha parada.

Name of Drug	Initial weight	Weight after Churnikarana	Loss	Yield in %
Haridra	50gm	46gm	4gm	92%

Showing results from Hingulottha Parada Shodhana

Wt of Ashoditha Parada taken	Wt of Shoditha Parada	Loss	Yield in %
279g	271g	8gm	97.13%

Showing results from Gandhaka Shodhana using Godugdha.

Wt of Gandhaka taken	Wt of Shoditha Gandhaka obtained	Loss	Yield in %
500 g	483 g	17gm	84.6%
483 g	455g	28gm	
455g	423g	32gm	

Showing results from preparation of Kajjali.

Wt of Parada	Wt of Gandhaka	Wt of Kajjali obtained	Loss	Yield in %
250gm	250gm	480gm	20gm	96%

Showing results from Kapittha moola kashaya Bhavana of Kajjali.

Bhavana Dravya	Quantity of bhavana dravya	Initial Quantity of Kajjali taken	Final Quantity obtained	Gain	Yield in %
Kapittha moola kashaya	150ml/day For 3days	300gm	315gm	15gm	107.14%

Showing results from Kupi paka of Bhavitha Kajjali(vati).

Weight of Kajjali (vati)taken	Quantity of kupi product obtained	Loss	Yield in %
262gm	149gm	113gm	56.87%

Showing results from Bhavana of kupi product with Kapittha moola kashaya and Bilwa moola kashaya.

Bhavana Dravya	Quantity of bhavana dravya	Quantity of Kupi product taken	Quantity obtained	Gain	Yield in %
Kapittha moola kashaya	100ml/day for 3 days	50gm	55gm	5gm	110%
Bilwa moola kashaya	100ml/day for 3 days	55gm	59gm	4gm	107.27%

Showing results from Churnikarana of Drugs for final product

Name of Drug	Initial weight	Weight after Churnikarana	Loss	Yield in %
Twak	50gm	32gm	18gm	64%
Ela	50gm	33gm	17gm	66%
Patra	50gm	38gm	12gm	76%
Nagakeshara	50gm	38gm	12gm	76%
Karpura	50gm	48gm	2gm	96%
Lavanga	50gm	42gm	8gm	84%

Showing Mardana of ingredients to obtain Final product- Poornachandrodaya sindoora:

Name of Dravyas (Ingredients)	Total Quantity Taken	Final Product	Weight Loss	Yield in %
• Bhavitha Kupi Product (30 g), • Fine powders of Twak, Ela, Patra, Nagakeshara, Karpura, Lavanga – 15 g each	120gm	120gm	nil	100%

B. Analytical Results

Showing Results of Organoleptic characters *of Kajjali, Kupi product, Bhavitha kupi product, Poornachandrodaya sindoora.*

Physical test	*Kajjali*	*Kupi product*	*Bhavitha kupi product*	*Poornachandrodaya sindoora*
Colour	Black	Brick red	Brick red	Red
Odour	Characteristic	Characteristic	Characteristic	Characteristic
Taste	Tasteless	Tasteless	Astringent	Astringent
Touch	Fine	Fine	Fine	Fine

Showing Results of Physical tests of Kajjali, Kupi product, Bhavitha kupi product, Poornachandrodaya sindoora.

Parameter	*Kajjali*	*Kupi product*	*Bhavitha Kupi product*	*Poornachandrodaya sindoora*
pH (10 % Aqueous Solution)	9.98±0.10	10.21±0.10	9.67±0.10	9.23±0.10
Total Ash value	Nil	Nil	2%	4.5%
Acid insoluble ash	Nil	Nil	0.02%	0.067%
Water soluble ash	Nil	Nil	1.98%	4.41%
Loss on drying at 105^0C	0.48%	0.18%	0.105%	13.93%

Showing XRD results of *Kajjali*

Sample	Compound Name	Chemical Formula	Crystal Structure
Kajjali	Metacinnabar	HgS	Cubic
	Sulphur	S	Orthorhombic

Showing XRD results of *Kupi product*

Sample	Compound Name	Chemical Formula	Crystal Structure
Kupi product	Metacinnabar	HgS	Trigonal
	Sulphur	S	Orthorhombic

Showing XRD results of *Bhavitha kupi product*

Sample	Compound Name	Chemical Formula	Crystal Structure
Bhavitha kupi product	Metacinnabar	HgS	Trigonal
	Sulphur	S	Orthorhombic

Showing XRD results of *Poornachandrodaya sindoora*

Sample	Compound Name	Chemical Formula	Crystal Structure
Poornachandrodaya sindoora	Metacinnabar	HgS	Trigonal
	Sulphur	S	Orthorhombic

Showing SEM EDS result of *Kajjali*

Sl.no	Element	Weight %	Atomic %
1	C	12.74	53.96
2	S	17.95	28.47
3	Hg	69.30	17.57

Showing SEM EDS result of *Kupi product*

Sl.no	Element	Weight %	Atomic %
1	C	12.43	57.86
2	S	12.12	21.12
3	Hg	75.45	21.02

Showing SEM EDS result of *Bhavitha kupi product*

Sl.no	Element	Weight%	Atomic%
1	C	14.15	61.53
2	S	11.77	19.18
3	Hg	74.08	19.30

Showing SEM EDS result of *Poornachandrodaya sindoora*

Sl.no	Element	Weight%	Atomic%
1	C	62.28	83.37
2	O	14.38	14.45
3	K	0.92	0.38
4	Hg	22.42	1.80

Showing Particle Size results of *Kajjali, Kupi product, Bhavitha kupi product, Poornachandrodaya sindoora.*

Sl.no	Sample	Mean diameter(nm)
1	Kajjali	474.6nm
2	Kupi product	466.3nm
3	Bhavitha kupi product	249.1nm
4	Poornachandrodaya sindoora	625nm

Showing FTIR results of *Kajjali*

Wave number (cm^{-1})	Functional group / bonds	Interpretation
3566	O–H / N–H stretching	Hydroxyl or amine groups, possibly moisture/organic content
2919	C–H stretching (alkane)	Aliphatic C–H groups, organic components
2565	S–H stretching (thiols)	Sulfur-hydrogen bond, consistent with HgS
2258	C≡C or C≡N stretching	Minor nitrile/alkyne or impurities
979, 857	C–H bending	Organic structures or Hg–S vibrations
695	Hg–S stretching	Strong mercury sulfide bond vibrations

Showing FTIR results of *Kupi product*

Wave number (cm^{-1})	Functional group / bonds	Interpretation
3567	O–H / N–H stretching	Presence of hydroxyl/amine groups, moisture or organic matter
2923	C–H stretching (alkane)	Aliphatic hydrocarbons or organic impurities
2285	C≡N or C≡C stretching	Trace organic compounds
2089	C≡C or C≡N (weak)	Unsaturated/nitrile groups
1911	Overtone/combination band	Complex inorganic vibrations
1456	C–H bending / aromatic vibration	Aromatic or alkane content
1147	C–O stretching	Oxygenated functional groups

Showing FTIR results of *Bhavitha kupi product*

Wave number (cm^{-1})	Functional group / bonds	Interpretation
2981	C–H stretching (alkane)	Aliphatic hydrocarbons present
1927	Overtone/combination band	Minor conjugated carbonyl or unsaturated species
1575	C=C stretch / N–H bending	Aromatic or amine groups
1385	C–H bending (methyl)	Alkyl groups or nitro vibrations
1193	C–O stretching / C–N stretching	Oxygenated or amine groups
1019	C–O / aromatic fingerprint	Oxygenated organics or aromatic substitutions

Showing FTIR results of *Poornachandrodaya sindoora*

Wavenumber (cm^{-1})	Functional group / Bonds	Interpretation
3310.59	O–H / N–H stretching	Presence of hydroxyl groups (alcohol/phenol) or amine group
2926.67	C–H stretching (aliphatic)	Indicates aliphatic $–CH_2$/$–CH_3$ groups
1607.97	C=C stretching / N–H bending	Suggests aromatic ring vibration or amine bending
1452.53	C–H bending (aliphatic)	CH_2/CH_3 deformation modes
1367.98	C–H bending (methyl group)	Confirms presence of alkane groups
1263.07	C–O stretching (alcohol/ether)	Suggests alcohols, ethers, or phenolic C–O
1150.54	C–O–C stretching / C–N stretch	Presence of ether/amine type linkages
1066.82	Si–O stretching / C–O stretch	Indicates silicate/mineral phases or alcohol/ether C–O
1002.92	Si–O stretching	Strong indication of silicate/mineral structure
780.94	Aromatic C–H out of plane bend	Suggests aromatic substitution pattern

Showing NPST results of *Poornachandrodaya sindoora (Kupi product).*

Sample	Phase	Observation (Colour Pattern)	Interpretation
Poornachandrodaya Sindoora (Kupi product)	Phase 1 (0–5 mins)	Orange central spot, white margin, brick-red intermediate circle, forming dark brown periphery.	Initial reaction and interaction of ingredients, marking the start of formulation changes.
	Phase 2 (5–20 mins)	Central spot fading, white ring prominent, intermediate circle orange, peripheral dull brown; thin white line appears.	Progressive transformation and partial stabilization of components.
	Phase 3 (20 mins–1 day)	Faint brown central spot, prominent white ring, pale orange intermediate circle, faded grey periphery, thin white line distinct.	Complete reaction and final stabilization, confirming proper preparation and uniformity of the formulation.
Conclusion	-	-	Triphasic colour pattern confirms the complete reaction and stabilization of all ingredients, validating authenticity, safety, and proper formulation of Poornachandrodaya Sindoora.

V. DISCUSSION

Poornachandrodaya Sindoora is a herbo-mineral *Kupipakwa Rasayana* prepared from Kajjali, which is obtained by triturating *Shuddha Parada and Shuddha Gandhaka*. The Kajjali is first subjected to three days of Bhavana using Kapittha moola kashaya, followed by Kramagni Paka to yield the Kupi product.

This product is then sequentially treated with three days of Bhavana using Kapittha moola kashaya and Bilwa moola kashaya, which enhances its digestive (Deepana-Pachana) and Tridoshaghna properties. Finally, fine powders of *Twak, Ela, Patra, Nagakeshara, Karpura, and Lavanga* are incorporated to prepare the final formulation.

Discussion on Hingulottha Parada: Hingula (Cinnabar) contains Parada (mercury) chemically bonded with Gandhaka (sulfur), which acts as an innate co-drug for Parada Bandha. This association facilitates the transformation of inorganic mercury into a pharmaceutically safe, absorbable, and therapeutically effective form.

Bhavana of Hingula with Nimbu swarasa: Mechanical trituration along with acidic media converts Hingula into finer particles and helps in sublimation, Here the surface area increases, this helps for rapid and uniform reaction. ¬ Citric acid helps in disintegration of HgS, Organic acid is responsible to weaken the bond and hence facilitates dissociation of mercury.

Hingulottha Parada- Mardana with Haridra: Parada extracted from Urdhwapatana vidhi was triturated with Haridra churna for 24 hours, to remove the impurities present in Parada and to ensure further purity, safety and specific activity.

Discussion on Gandhaka Shodhana: *Gandhaka Shodhana* was done by *Kurmaputa method*, using milk as media.

Discussion on Kajjali Preparation: Equal parts *Shuddha Parada and Shuddha Gandhaka* were triturated until the mixture turned jet-black, fine, soft, and stable, meeting classical *Siddhi Lakshanas*. This ensures complete mercury-sulfur formation, reduces free mercury, and preserves therapeutic efficacy. *Gandhaka* quality and proper trituration are essential for a safe, effective product.

Kajjali was prepared over 210 hours. Due to spillage, the weight decreased from 500 g at the start to 480 g at the end. This highlights that utmost care is necessary during *Kajjali* preparation.

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A. Discussion on Kupi Product Preparation

The *Kupi* product of *Poornachandrodaya Sindoora* was prepared over 55 hours via classical *Kupi Paka*. In *Purva Karma*, the *Kupi* was layered with Multani Mitti cloth and filled with Bhavitha Kajjali (262 g) in a *Valuka Yantra* for uniform heating. During *Pradhana Karma*, temperature was gradually raised from Mridu to Teevra Agni, ensuring complete mercury-sulfur transformation, confirmed by *Siddhi Lakshanas*. Paschat Karma involved cooling and careful collection; the upper portion (149 g) exhibited the desired reddish-black colour and fine texture, while minor residues remained at the base. The product was preserved for physicochemical evaluation.

1) Discussion on preparation of *Poornachandrodaya sindoora*

The Kupi product was sequentially triturated with Kapittha Moola Kashaya (3 days) and Bilwa Moola Kashaya (3 days) to reduce particle size, enhance uniformity, and boost pharmacological properties. Finally, fine powders of Twak, Ela, Patra, Nagakeshara, Karpura, and Lavanga were incorporated to form a stable, palatable, and bioavailable Sindoora. It is indicated for Pancha Kasa, Pancha Chardi, Kasa, Hridroga, Aruchi, Swarabhanga, and Mandagni, with a dose of two valla and Madhu, Sita, or Laja Churna as Anupana.

2) Discussion on pH value

The pH values of Kajjali 9.98, Kupi product 10.21, Bhavitha Kupi 9.67, and Poornachandrodaya Sindoora 9.23 respectively.

3) Discussion on Total Ash Value

The Total Ash Values for Kajjali, Kupi product were nil and Bhavitha Kupi product, and Poornachandrodaya Sindoora were found to be 2%, and 4.5%, respectively.

4) Discussion on acid insoluble ash

The acid insoluble ash values for Kajjali, Kupi product were nil and Bhavitha Kupi product, and Poornachandrodaya Sindoora were found to be 0.02%, and 0.067%, respectively.

5) Discussion on water soluble ash

The water-soluble ash values for Kajjali, Kupi product were nil and Bhavitha Kupi product, and Poornachandrodaya Sindoora were found to be 1.98%, and 4.41%, respectively

6) Discussion on loss on drying at 105^0c

The loss on drying values indicates the moisture and volatile content within each formulation. While Kajjali, Kupi product, and Bhavitha Kupi product exhibit relatively low moisture content (0.48%, 0.18%, and 0.105%, respectively), Poornachandrodaya Sindoora shows a significantly higher loss on drying (13.93%), this increase is attributed to the addition of fine powders of herbal drugs in the final stage, which contribute to higher moisture retention and may require special handling.

7) Discussion on XRD Analysis

XRD analysis of the formulations shows progressive phase transformations and structural evolution:
Kajjali: Sharp peak at $2\theta \approx 26.30°$ confirms β-HgS (Metacinnabar, cubic); minor peaks.Kupi Product: Peaks at 26.46° (β-HgS) and 31.18° (α-HgS, Cinnabar) Bhavitha Kupi Product: Dominant α-HgS (31.18°) with low-angle peaks (5°–6°).Poornachandrodaya Sindoora: Strong α-HgS (31.16°) and secondary β-HgS (26.48°) peaks.

8) Discussion on SEM-EDS Analysis

SEM-EDS analysis showed the following elemental composition (wt%): Kajjali – Hg 69.30 wt%, S 17.95 wt%, C 12.74 wt%; Kupi Product – Hg 75.45 wt%, S 12.12 wt%, C 12.43 wt%; Bhavitha Kupi Product – Hg 74.08 wt%, S 11.77 wt%, C 14.15 wt%. The Poornachandrodaya Sindoora contained C 62.28 wt%, O 14.38 wt%, Hg 22.42 wt%, and K 0.92 wt%, reflecting substantial herbal integration in the final formulation.

9) Discussion on Particle Size Analysis (by Zeta PALS method)

Kajjali showed a particle size of 474.6 nm, reflecting effective trituration and uniform HgS formation. Kupi Product was slightly smaller (466.3 nm), maintaining fine size while allowing phase transformation. Bhavitha Kupi Product decreased to 249.1 nm due to herbal Bhāvana, enhancing surface area and bioavailability. Poornachandrodaya Sindoora increased to 625 nm from added herbal powders but remained therapeutically suitable.

10) FTIR Analysis:

Kajjali exhibited strong Hg–S (695 cm^{-1}) and S–H (2565 cm^{-1}) peaks, confirming a pure HgS lattice with minor organic residues. Kupi Product showed O–H/N–H (3567 cm^{-1}), C–H, nitrile/alkyne, and C–O peaks, indicating partial herbal integration. Bhavitha Kupi Product displayed C–H, aromatic C=C/N–H, and C–O/C–N bands, reflecting extensive herbal incorporation. Poornachandrodaya Sindoora showed O–H/N–H, C–H, aromatic, C–O/C–N, and Si–O peaks, confirming a stable herbo-mineral matrix.

B. Discussion On NPST

There is no standard NPST for *Poornachandrodaya sindoora*. So, it was performed by the method used for analyzing Sindoora compounds. The white area was more prominent in 3rd phase suggesting the present of mercury in the compound.

VI. PROBABLE MODE OF ACTION

Therapeutically, *Poornachandrodaya Sindoora* acts on multiple conditions:

1) *Pancha Kasa*: *Karpura, Lavanga, and Twak* provide antimicrobial, anti-inflammatory, and bronchodilatory effects, while the mineral base supports normalization of respiratory tissues.
2) *Pancha Chardi: Ela, Patra, and Twak* balance Agni, reduce nausea, and provide carminative effects to relieve vomiting.
3) *Hridroga: Kajjali and Bilwa moola* support cardiac metabolism, act as antioxidants, and rejuvenate myocardial tissue.
4) *Aruchi: Bhavana with Kapittha and Bilwa moola*, along with Twak and Ela, stimulate digestion and enhance appetite, alleviating loss of taste.
5) *Mandagni: Kapittha moola, Bilwa moola*, and digestive herbs improve metabolic activity and restore normal digestive fire.
6) *Swarabhanga*: *Karpura, Lavanga, and Twak* provide antimicrobial, anti-inflammatory, and tissue-strengthening actions, while detoxifying minerals reduce throat inflammation, clear Kapha, and restore vocal function.

Overall, *Poornachandrodaya Sindoora* functions through a synergistic integration of minerals and herbs: the mineral base ensures detoxification and rejuvenation, sequential Bhavana enhances metabolic and digestive efficacy, and aromatic powders provide antimicrobial, carminative, and tissue-protective benefits. Together, these mechanisms allow the formulation to effectively manage respiratory, digestive, cardiac, and vocal disorders as indicated.

VII. CONCLUSION

1) *Poornachandrodaya Sindoora* is a *Sagandha, Sagni, Kantastha, Bahirdhooma Kupipakwa Rasayana*[9]. There are three references available in various Rasa texts, all showing no variation in the quantity of ingredients.
2) Among these, the *Rasayoga Sagara* reference was selected for the present study, as it is considered one of the authoritative texts of Ayurveda, specified in the First Schedule of the Drugs and Cosmetics Act.
3) The key ingredients are *Shuddha Parada* and *Shuddha Gandhaka*, with *Kapittha Moola Kashaya* and *Bilwa Moola Kashaya* used as Bhavana Dravyas, along with the fine powders of *Twak, Ela, Patra, Nagakeshara, Karpura*, and *Lavanga*. It is indicated in *Pancha Kasa, Pancha Chardi, Kasa, Hridroga, Aruchi, Swarabhanga*, and *Mandagni*. The prescribed dose is 2 *Valla*, administered with *Laja Churna*, *Sita*, and *Madhu* as *Anupana*.
4) *Samaguna Kajjali* was prepared by Mardana of 250 g each of *Shoditha Parada and Shoditha Gandhaka* for 210 hours. *Kapittha Moola Kashaya* was then added, and Bhavana was performed for three days. From this, 264 pills were prepared, of which about 262 g (230 Vatis in no.) were subjected to Kupipaka, yielding 149 g of product. Approximately 50 g of the Kupi product was taken in a Khalva Yantra, powdered, and subjected to Bhavana with *Kapittha Moola Kashaya* and *Bilwa Moola Kashaya* for three days each. After Bhavana, 30 g of the Bhavitha Kupi product was taken and mixed with 15 g each of finely powdered *Twak, Ela, Patra, Nagakeshara, Karpura, and Lavanga*, triturated to a homogeneous mixture to obtain the final product — *Poornachandrodaya Sindoora*.

5) Physical test shows Poornachandrodaya sindoora is red in colour with astringent to taste, fine to touch, characteristic odour and with pH –9.23±0.10.

6) XRD study compared with 2θ angle and JCPDF standards and confirms that *Poornachandrodaya sindoora* is a compound of Metacinnabar in Trigonal crystal system, Sulfur in Orthorhombic crystal system.

7) Elements present in *Poornachandrodaya sindoora* has confirmed by the EDS study are K, O, Hg, C in the Weight percentage of 0.92, 14.38, 22.42, and 62.28 respectively.

8) FTIR analysis of *Poornachandrodaya sindoora* shows it contains hydroxyl and amine groups, aliphatic and aromatic C–H, C–O and C–N linkages, and silicate/mineral (Si–O) components.

9) Mean particle size of *Poornachandrodaya sindoora* was found to be 625nm.

10) NPST[10] observation of *Poornachandrodaya Sindoora* at the 3rd phase revealed that the central spot had faded to a faint brown colour, surrounded by a prominent white ring. The intermediate ring appeared pale orange, while the brown colour of the peripheral ring completely disappeared, turning into a faded grey. A thin white line between the intermediate and peripheral rings became more distinct

ANNEXURE & PHOTOS

Fig no 1
Raw Hingula

Fig no 2
Nimbu Phala

Fig no 3
Hingula mardana

Fig no 4
Hingula after mardana

Fig no 5
Hingula placed in lower pot

Fig no 6
Sandhibandhana of Hingulottha parada yantra

Fig no 7
Urdhwapatana vidhi

Fig no 8
Parada sublimated in upper pot

Fig no 9
Parada collected

Fig no 10 Parada shodhana with Haridra churna

Fig no 11 Shoditha parada

Fig no 12 Raw Gandhak a

Fig no 13
Milk for gandak a shodhana

Fig no 14
Gandhak a placed over cloth

Fig no 15
Ignition of Cowdung cak es

Fig no 16
Shoditha Gandhak a

Fig no 17
Shodita parada tak en in k halva

Fig no 18
Addition of Gandhak a

Fig no 19
Preparation of k ajjali

Fig no 20
Observation of Kajjali after 5 min

Fig no 21
Observation of Kajjali

Fig no 22
Rekhapurnatva test

Fig no 23
Varitara test

Fig no 24
Unnama test

Fig no 25
Nirbchandratva

Fig no 26
Kapittha moola

Fig no 27
Kapittha moola k ashaya

Fig no 28
Ph of Kapittha
moola kashaya

Fig no 29
Kajjali taken for bhavana

Fig no 30
Bhavana of
Kajjali with
Kapittha moola

Fig no 31
Subhavitha lakshana

Fig no 32
Vati prepared from
Bhavitha Kajjali

Fig no 33
Mritlepitha kacha
kupi

Fig no 34
Filling of vati
into kupi

Fig no 35
Filling of sand into kupi
placed Valuka yantra

Fig no 36
Valuka yantra
placed over
Bhatti

Fig no 37
Initiation of flame

Fig no 38
Appearance of
White fumes

Fig no 39
Appearance of Yellow
fumes

Fig no 40
Blue flame

Fig no 41
Tapta shalaka
insertion

Fig no 42
Sheeta shalaka insertion

Fig no 43
Sindoora test

Fig no 44
Suryodaya lakshana

Fig no 45
Copper coin test

Fig no 46
Cork ing process

Fig no 47
Scraping of k upi

Fig no 48
Break ing of
k upi

Fig no 49
Kupi product

Fig no 50
Kapittha moola
k ashaya

Fig no 51
Bhavana of k upi product
with Kapittha moola
k ashaya

Fig no 52
Subhavitha lak shana
observed

Fig no 53
Bilwa moola

Fig no 54
Bilwa moola
k ashaya

Fig no 55
Ph of Bilwa moola
k ashaya

Fig no 56
Bhavana with
Bilwa moola
k ashaya

Fig no 57
Subhavitha lak shana

Fig no 58
Bhavitha k upi
product

Fig no 59
Twak

Fig no 60
Ela

Fig no 61
Patra

Fig no 62
Nagak esara

Fig no 63
Karpura

Fig no 64
Lavanga

Fig no 65
Fine powder of
Twak

Fig no 66
Fine powder of
Ela

Fig no 67
Fine powder of
Patra

Fig no 68
Fine powder of
Nagak esara

Fig no 69
Fine powder of
Karpura

Fig no 70
Fine powder of Lavanga

Fig no 71
Mixing of fine powders into
Bhavitha product

Fig no 72
Poornachandrodaya
sindoora

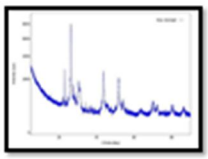


Fig no 73 XRD of Kajjali

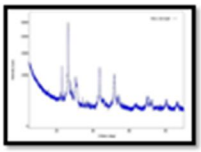


Fig no 74 XRD of Kupi product

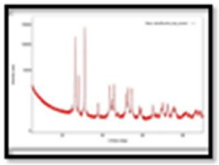


Fig no 75 XRD of Bhavitha Kupi product

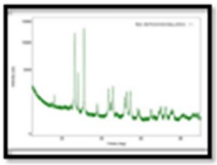
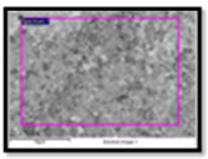


Fig no 76 XRD of Poornachandrodaya



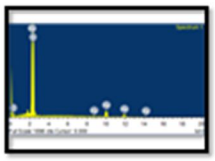
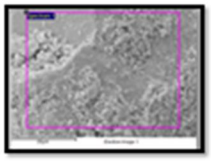


Fig no 77 SEM-EDS of Kajjali



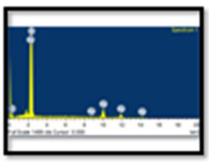


Fig no 78 SEM-EDS of Kupi product

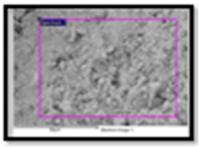
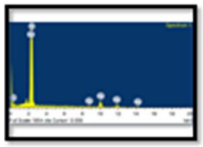



Fig no 79 SEM-EDS of Bhavitha Kupi product

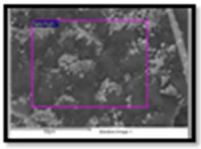
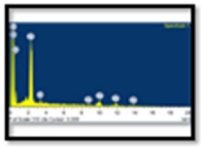



Fig no 80 SEM-EDS of Poornachandrodaya sindoora

FIG NO 81 PARTICLE SIZE ANALYSIS OF KAJJALI

FIG NO 82 PARTICLE SIZE ANALYSIS OF KUPI PRODUCT

FIG NO 83 PARTICLE SIZE ANALYSIS OF BHAVITHA KUPI PRODUCT

FIG NO 84 PARTICLE SIZE ANALYSIS OF POORNACHANDRODAYA SINDOORA

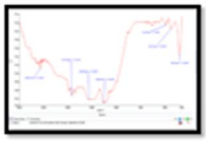


Fig no 85 FTIR of Kajjali

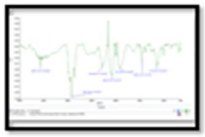


Fig no 86 FTIR of Kupi product

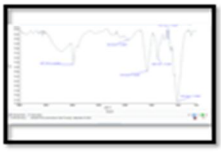


Fig no 87 FTIR of Bhavitha Kupi product

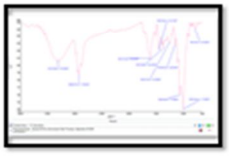


Fig no 88 FTIR of Poornachandrodaya sindoora

Fig no 89 NPST of Poornachandrodaya sindoora

VIII. ACKNOWLEDGEMENT

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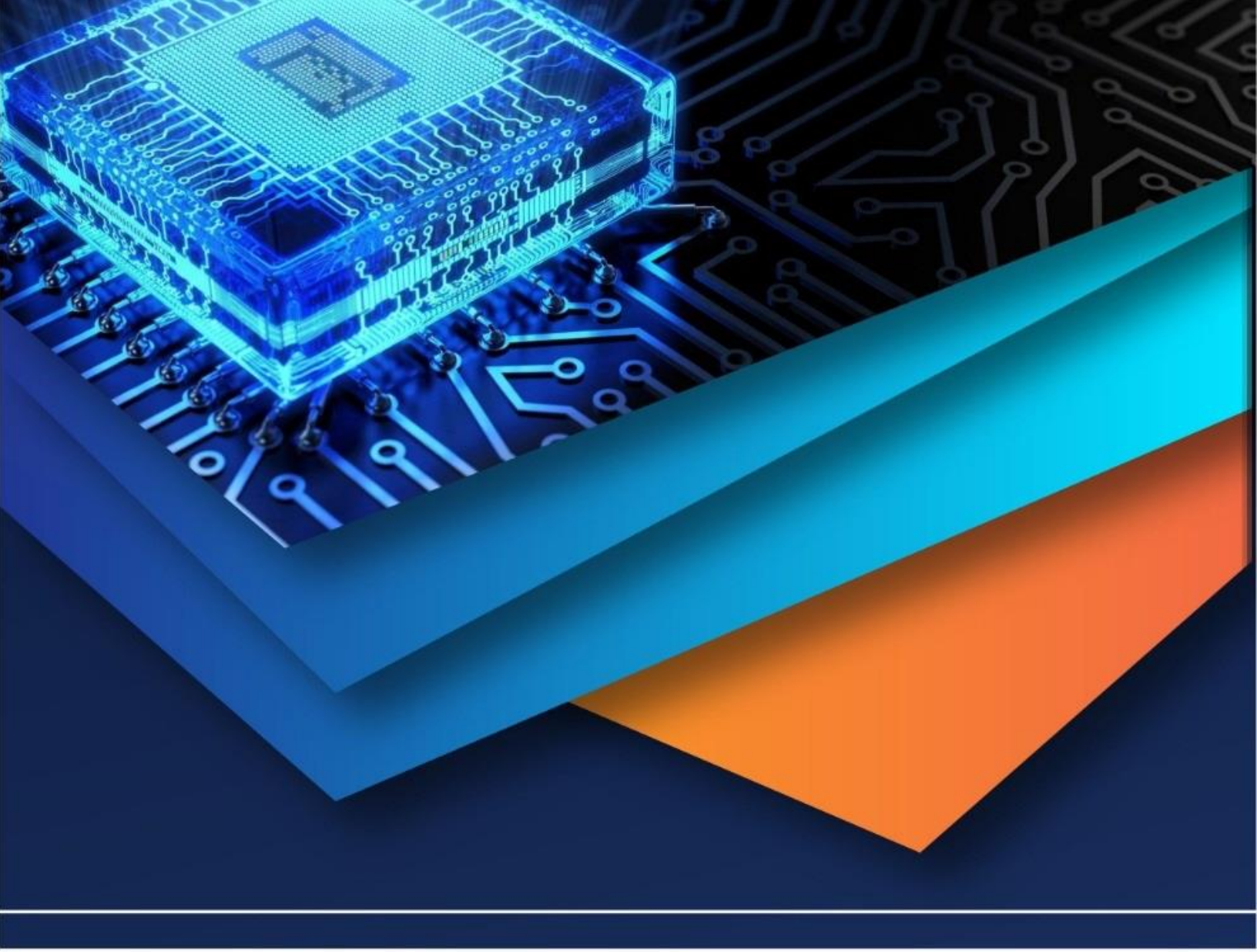

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