

**ANALYTICAL STUDY OF KASISABHASMA AND ANNABHEDI CHENDURAM WITH REFERENCE TO THEIR QUALITATIVE AND QUANTITATIVE CHEMICAL ANALYSIS.****\*<sup>1</sup>Dr. Ashwin Ashok Shete, <sup>2</sup>Dr. Avinash Ashok Shete and <sup>3</sup>Dr. PVNR Prasad**<sup>1</sup>MD (Rasashastra and Bhaishajyakalpana), MBA (HRM) Assistant Professor, Dr. D. Y. Patil College of Ayurveda and Research Centre, Pimpri, Pune 411018.<sup>2</sup>MS (Streeroga Evam Prasutitantra) Consultant, Vatsalya Nursing Home, Pune 411014.<sup>3</sup>MD (Rasashastra and Bhaishajyakalpana) Associate Professor, PG Dept., of Rasashastra, Dr. NRS Govt. Ayurvedic College, Vijayawada 520002.**\*Corresponding Author: Dr. Ashwin Ashok Shete**

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**ABSTRACT**

'Kasisa' is the Iron containing mineral described under Uparasa group by Rasacharyas. 'Kasisa' is presented in this article in two forms i.e Kasisa bhasma and Annabhedi chenduram. Annabhedi chenduram is siddha medicine. (Siddha is also a traditional medical system of India which is of Dravidian origin and has its entire literature in Tamil language.) Many research programs were conducted on Kasisa Bhasma of Ayurveda and Annabhedi Chendooram of Siddha medicine for the management of Anaemia. So far no comparative study is taken up to identify the supremacy between the two. So comparative study with respect to analytical view studied in this article. Especially organoleptic tests as per ayurveda and chemical qualitative and quantitative tests have done. Qualitative analysis reveals acidic and basic radical in both the compound. Whereas quantitative analysis was for Iron content in raw material, in process material and finished product of both the drug. Kasisa Bhasma and Annabhedi Chendooram contain number of similarities both in terms of composition and preparation with minimum variations.

**KEYWORDS:** 'Kasisa, acidic radical, quantitative analysis, qualitative radical.**INTRODUCTION**

Ayurveda, the divine science describes the health and diseases. *Rasa* (treatment with mercurial medicines) is said to be superior to all other therapies because of the low dosage, not producing any distaste and restoring the health faster. Like *Ayurveda*, *Siddha* is also a traditional medical system of India. It is of *Dravidian* origin and has its entire literature in Tamil language. The basic concepts of the *Siddha* medicine are the same as those of *Ayurveda*.

'Kasisa' is described under *Uparasa* group by Rasacharyas. It is one among the Iron containing minerals. While reviewing the Modern literature, in the present era rapid advancement in pharmacology, not only influenced *Iron therapy* but also its various forms of pharmacological compounds came in the field of medical practice.

'Kasisa' which is an *iron* compound is presented in this article in two forms i.e *Kasisa bhasma* and *Annabhedi chenduram*. Especially organoleptic tests as per ayurveda and chemical qualitative and quantitative tests have

done. Qualitative analysis was acidic and basic radical in both the compound. Whereas quantitative analysis was for Iron content in raw material, in process material and finished product of both the drug.

Kasisa Bhasma and Annabhedi Chendooram contain number of similarities both in terms of composition and preparation with minimum variations.

**Analytical Study**

Various Organoleptic tests are mentioned in *Rasa shastra* texts to confirm and to assess the quality of the prepared medicine. However all these are based on naked eye observation and are subjective. Most importantly, they hardly provide any information on the compositional and structural aspects of these medicines.

The compound preparation of *Rasa Shastra* should be understood well and interpreted vividly in the light of modern technology.

In the study following analytical methods were adopted.

#### Chemical Analysis

- Qualitative analysis
- Quantitative analysis

#### Subjective parameters

- a. **Varna pariksha:** Kasisa bhasma and Annabhedi chenduram are brownish red.
- b. **Rasa Pariksha:** Tasteless.
- c. **Gandha pariksha:** No specific odour is found.

#### Qualitative Analysis

**Table 1: Test for Acid Radical.**

| Experiment   | Observation                          | Confirmatory                                    | Inference                      |
|--|--------------------------------------|---|--------------------------------|
| Small amount of sample was taken, and then 2ml of dil. HCl was added to it and heated.                           | No gas evolved                       | -   | SO <sub>3</sub> is absent      |
| Small amount of sample was taken, and then 2ml of dil. H <sub>2</sub> SO <sub>4</sub> was added to it and heated | Colourless gas evolved without odour | -   | Cl, Br, I & Acetate are absent |
| Dissolve a little amount of sample in dil. HCl & add BaCl <sub>2</sub>   | White precipitate obtained           | Precipitate insoluble in conc. HNO <sub>3</sub> | SO <sub>4</sub> is present     |

#### RESULTS

SO<sub>4</sub> was found present both in Kasisa Bhasma & Annabhedi Chenduram.

#### Test for Basic Radical

Original solution(O.S) of the different samples were prepared in Aqua regia.

- Original samples + dil. HCl → No precipitate was observed → first group absent.
- (O.S) was diluted with distilled water and H<sub>2</sub>S gas was passed in small portion of the solution → black precipitate appeared.
- H<sub>2</sub>S gas was passed continuously in the whole solution and filtered.
- If no precipitate – Group II absent (Pb, Bi, Cu, Cd, As, Sb, Sn)
- if filtrate is formed- dil H<sub>2</sub>SO<sub>4</sub> was added – if no white precipitate indicates absence of Lead.

When excess NH<sub>4</sub>OH was added to the filtrate- reddish brown solution was obtained indicating the presence of Iron.

#### QUANTITATIVE ANALYSIS OF IRON MATERIALS AND METHOD

##### Materials

##### A. Samples to be Analysed

1. Raw material- Kasisa 1 gm
2. Purified Kasisa- 1 gm
3. Final Product- Kasisa bhasma 1 gm

##### B. Chemicals required

1. Nitric acid
2. Hydrochloric acid
3. Ammonium hydroxide

d. **Sparsha Pariksha:** On touch it is soft in texture.

#### Objective Parameters

##### Chemical Analysis

Chemical analysis is the technique to identify the various constituents present in the sample qualitatively and quantitatively by using certain chemicals and observing the chemical reactions occurring there on. qualitative analysis was done by group analysis. For quantitative analysis mainly volumetric method and gravimetric methods were adopted.

##### C. Apparatus required

1. Weighing balance
2. Beaker 250 ml
3. Conical flask
4. Filter conc, 42 No. filter paper and filter stand
5. Glass rod
6. Silica crucible
7. Blower
8. Heating device

#### Principle

In original solution the Ferrous ions are first converted into ferric state by oxidising agent conc. HNO<sub>3</sub>. Ferric ions are precipitated by NH<sub>4</sub>OH as hydrous ferric oxide by gravimetric analysis. Then the percentage of iron in the sample was calculated.

#### METHOD

1. At first accurately 1 gm of sample was made soluble in 40 ml of aqua- regia on heating and a yellowish brown solution was prepared. Then it was cooled and excess of Ammonium was observed. The solution became brownish red in colour and precipitation was started. After the completion of reddish brown precipitation of Ferric hydroxide the precipitate was filtered and white colour filtrate was tested for further precipitation by adding ammonium hydroxide till no precipitation occurred. The precipitate was washed with distilled water and taken for analysis.
2. The precipitate with the filter paper was taken into the weighed clean and dried silica crucible.
3. Before taking the precipitate into silica crucible, the crucible was kept in an oven for 1 hr and weight was recorded. The same procedure was repeated till three consecutive constant weight of the crucible and weight was noted.

4. The crucible was first heated slowly by means of oxidising flame, then it was heated with intense heat till red hot by means of a blower for 1-2 hr till the conversion into ash of ferric oxide.
5. The crucible was cooled and weighed with ferric oxide.
6. The weight of empty crucible was deducted from the weight of the crucible with drug and weight of the ferric oxide was calculated.
7. Weight of Iron was calculated by multiplying the conversion factor with weight of ferric oxide.
8. From the weight of Iron in the sample, the percentage of the Iron was calculated.

#### Calculation

##### For raw Kasisa

Weight of the sample=W=1 gm=1000mg  
 Weight of the empty crucible=A=30.700gm  
 Weight of crucible with drug=B=30.925gm  
 Weight of drug=B-A=225mg  
 Weight of Iron= (B-A) × conversion factor  
 =225 × 0.6994  
 = 157.36mg=C

Percentage of Iron in the sample= (Weight of Iron / weight of the sample) × 100  
 =(C/W) × 100  
 = (157.36/1000) × 100  
 = 15.7%

##### For shodhita Kasisa

Weight of the sample=W=1 gm=1000mg  
 Weight of the empty crucible=A=30.700gm  
 Weight of crucible with drug=B=30.940gm  
 Weight of drug=B-A=240mg  
 Weight of Iron= (B-A) × conversion factor  
 =240 × 0.6994  
 =167.85 mg  
 = C

Percentage of Iron in the sample= (weight of Iron / weight of the sample) × 100  
 = (C/W) × 100  
 = (167.85 / 1000) × 100  
 =16.78%

##### For Kasisa bhasma

Weight of the sample=W=1 gm=1000mg  
 Weight of the empty crucible=A=30.700gm  
 Weight of crucible with drug=B=31.284gm  
 Weight of drug=B-A=584mg  
 Weight of Iron= (B-A) × conversion factor  
 =584 × 0.6994  
 = 408.46 mg  
 = C

Percentage of Iron in the sample= (weight of Iron / weight of the sample) × 100  
 = (C/W) × 100  
 = (408.46 / 1000) × 100

=40.8%

##### For Annabhedi chenduram

Weight of the sample=W=1 gm=1000mg  
 Weight of the empty crucible=A=30.700gm  
 Weight of crucible with drug=B=31.240gm  
 Weight of drug=B-A=540

Weight of Iron= (B-A) × conversion factor  
 =540 × 0.6994  
 = 377.67 mg  
 = C

Percentage of Iron in the sample= (weight of Iron / weight of the sample) × 100  
 = (C/W) × 100  
 = (377.67 / 1000) × 100=37.7%

**Table 2: Showing the Percentage of Iron in Raw, Shodhita and Final Products.**

| Sample              | Percentage of Iron |
|---------------------|--------------------|
| Raw Material        | 15.7%              |
| Shodhita Kasisa     | 16.7%              |
| Kasisa Bhasma       | 40.8%              |
| Annabhedi chenduram | 37.7%              |

#### RESULT

Percentage of Iron is more in Shodhita Kasisa than Raw Kasisa.

Percentage of Iron is more in Kasisa bhasma than Annabhedi chenduram.

#### DISCUSSION AND RESULTS

In analytical study, chemical analysis results are showing percentage of Iron in raw material, shodhit kasisa and finished products. So it reveals that, both the compounds are iron rich compound. In qualitative analysis, tests for acidic radical shows SO<sub>4</sub> group whereas basic radical test reveals iron.

#### CONCLUSION

In analytical study, chemical analysis results are showing percentage of Iron in raw material, shodhit kasisa and finished product. So it can be rich iron source for therapeutics.

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