ANALYTICAL COMPARATIVE STUDY OF DIFFERENT SHODHAN DRAVYA AND DIFFERENT PISHTI DRAVYA W.S.R TO AKIK

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ABSTRACT

Akik is very familiar Semi Precious stone in the world of stones. It is frequently used in many forms like ornaments, gifts, etc. But it has very good medicinal value which is practiced by traditional Vaidya’s & Hakim’s. Objective: Analytical Comparative Study of Different Shodhan Dravya And Different Pishti Dravya w.s.r to Akik. Method: Best quality of jalrahit akik taken for analytical study and prepared by two methods i.e. Gulab Arka & Kewda Arka for shodhan and pishti as per classical text references. Result: Analytical study shows that quantitatively and qualitatively it contains Sio2 and absorption in UV spectrum is also of standard value of agate. In microscopic level it shows nano-particles with agglomeration. Conclusion: Evaluation of Analytical study shown that the preparation with two different methods has slight difference in analytical value & physico-chemical properties.

Keyword: Ayurved, SemiPrecious Stone, Akik, Agate, Analytical Study

INTRODUCTION

Sheeto rukshaschittadosheshu geeto raktastambhee dardhyakari dvijaanaam |
Hemna saakam saadhtoateev vrushyah slakshanah shonah shasyatekoapyakeekah ||
Siddhabheshajamanimaala (Paaaradaadi Vargah - Dvitecyo Guchhah – 303)¹

Akik is semi precious stone which has properties of sheet (cold), ruksha (dry) guna and it work as Raktastambhak (To stop the bleeding) and Danta – Dardhyakark (strengthen the teeth). It has very strong result with swarna bhasma as Vrushya karma (Aphordiasic Action). As per vruddha vaidya and hakim’s opinion it gives very good result as Hruda balya (strengthen the heart), Garbha Rakshoghn (prevent foetus to get abort). As per traditional method akik pishti (powder) is used more frequently than bhasma as ratna maran process
is varjaya (restricted) and as per classical text it is prepared by two method i.e. Gulab Arka & Kewda Arka.

**Grahya -Agrahyatva** ²:-
Best quality of Jalrahit (without veined) akik to be taken for medicinal preparation.

**Shodhan of Akik** ²:-
Pure and Jalrahit akik heated and dipped in arka gulab or arka kewda for seven times each.

**Method of Preparation** ²:-
For preparation of akik pishti crushed akik powder has prepared and bhavna of arka gulab and arka kewda is used for 7 times each.

**Lakshan of Pishti** ² :-
That it is trititated with gulab arka & kewda arka and ground to a fine churna(powder) form is termed as Pishti or Pishtika.

**DISCUSSION**
The aim of this study is to know the particular physico-chemical changes and effect of different Samaskaras {Shodhan, pishti etc. (method of preparation)} during the pharmaceutical processing. These are the following parameter chosen to evaluate the process. The method employed was as per Ayurvedic Pharmacopoeia of India.

### Classical Analytical Parameters ² :- Organoleptic Character, Rekhapoornatwa, Slakshnatva

**Table 1: Organoleptic Character**

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Characters</th>
<th>AGBP</th>
<th>AKBP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Shabda(sound during chewing)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>2.</td>
<td>Sparsha(feeling during touch)</td>
<td>Soft</td>
<td>Soft</td>
</tr>
<tr>
<td>3.</td>
<td>Rupa(physical colour)</td>
<td>Light whitish red</td>
<td>darkish red</td>
</tr>
<tr>
<td>4.</td>
<td>Rasa(taste)</td>
<td>Like gulab</td>
<td>Like kewda</td>
</tr>
<tr>
<td>5.</td>
<td>Gandha(smell)</td>
<td>Like gulab</td>
<td>Like kewda</td>
</tr>
<tr>
<td>6.</td>
<td>Rekhapurnata (microfine powder passes in finger lines)</td>
<td>Present</td>
<td>Present</td>
</tr>
<tr>
<td>7.</td>
<td>Slakshnatvam(soft touch)</td>
<td>Present</td>
<td>Present</td>
</tr>
</tbody>
</table>

- On organoleptic evaluation both AGBP and AKBP showed smoothness in touch with essence of gulab and kewda in taste and produced odour of resp. flower arka.
- AGBP is slight light red in colour then AKBP.
- There is no perceptible sound during chewing.
- Weight of pishti increased by 1-1.5gm at each bhavna.
- Weight before process 313 gm and after process 331.5 gm of AGBP was achieved.
- Weight before process was 288.7 gm and after process was 308.2 gm of AKBP was achieved.
- Weight of AGBP has increased by 18.5 gm where weight of AKBP has increased by 18.8 gm. Hence there is no significant difference found in weight increment.
- Rekhapurnata and Slakshnata test indicates micro fineness of the Pishti with soft touch for body susceptibility.

Here both the Pishti passed all the classical physico-chemical parameters, so both the Pishti should be considered as properly prepared and having properties according to classical standards and found difference in colour, odour taste.

**Physico-Chemical Parameter** ³,⁴ :-
Loss on drying, Total Ash Value, Water soluble ash, pH Concentration Value, Conductivity Test.

**Table 2: Physico-chemical Character**

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Test</th>
<th>AGBP Value</th>
<th>AKBP Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>Loss On Drying</td>
<td>0.023 gm</td>
<td>0.008 gm</td>
</tr>
<tr>
<td>b)</td>
<td>Total Ash Value</td>
<td>0.026 gm</td>
<td>0.018 gm</td>
</tr>
<tr>
<td>c)</td>
<td>pH Estimation:</td>
<td>8.20</td>
<td>8.30</td>
</tr>
<tr>
<td>d)</td>
<td>Acid Insoluble Ash</td>
<td>0.029 gm</td>
<td>0.033 gm</td>
</tr>
<tr>
<td>e)</td>
<td>Water Soluble Ash</td>
<td>0.006 gm</td>
<td>0.023 gm</td>
</tr>
<tr>
<td>f)</td>
<td>Conductivity Test</td>
<td>107.1</td>
<td>107.5</td>
</tr>
</tbody>
</table>

a). Loss On Drying:-
To determines the amount of volatile matter (i.e., water drying off from the drug).
- The LOD values of AGBP and AKBP does not make any significant effect on moisture content.

b). Total Ash Value:-
Calculate the amount of ash with reference to the air-dried drug.
- Hence, it shows that the Bhavana Dravya used in pishti process does not make any significant effect on inorganic contents.

c) Acid Insoluble Ash:-
Calculate the content of acid-insoluble ash with reference to the air-dried drug.
- The acid insoluble ash values of AGBP and AKBP do not show any major difference on the acid insoluble ash values.

d). Water Soluble Ash:-
Calculate the amount of water-soluble ash with reference to the air-dried drug.
- The Water soluble values of AGBP and AKBP do not make any significant effect on the water soluble values.

e). pH Estimation:-
It indicates the Acidity or Alkalinity of a solution. As it shown alkaline nature for both sample.
- There is no remarkable difference obtained in pH value of AGBP & AKBP.

f). Conductivity Test:-
Conductivity of a substance is defined as 'the ability or power to conduct or transmit heat, electricity or sound'. When an electrical potential difference is placed across a conductor, its movable charges flow giving rise to an electric current. This property is called conductivity.
- The Conductivity of AGBP and AKBP do not make any significant effect on the conductivity.

**Analytical Parameters**

3. **SEM (Scanning Electron microscopic) & EDS (Electronic Dispersive Spectrometry), UV Spectrometry, XRD (X-Ray Diffraction).**

1. **SEM & EDS** :- Bhavit (coated) & Dry form of sample taken to perform the test which shown these results

a) **SEM:** The scanning electron microscope uses a focused beam of high energy electrons to generate a variety of signals at the surface of solid specimens. The signals
that derive from electron-sample interactions reveal information about the sample including external morphology (texture), chemical composition, and crystalline structure and orientation of materials making up the sample. In most applications, data are collected over a selected area of the surface of the sample, and 2-dimensional image is generated that displays spatial variations in these properties.

Fig 1: AGBP  Fig 2: AKBP

Table 3: Qualitative & Quantitative Analysis of AGBP & AKBP

<table>
<thead>
<tr>
<th>Element For AGBP</th>
<th>Weight%</th>
<th>Atomic%</th>
<th>Element For AKBP</th>
<th>Weight%</th>
<th>Atomic%</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>60.13</td>
<td>15.38</td>
<td>C</td>
<td>56.80</td>
<td>17.88</td>
</tr>
<tr>
<td>O</td>
<td>375.00</td>
<td>72.02</td>
<td>O</td>
<td>281.26</td>
<td>66.47</td>
</tr>
<tr>
<td>Mg</td>
<td>2.13</td>
<td>0.27</td>
<td>Mg</td>
<td>1.61</td>
<td>0.25</td>
</tr>
<tr>
<td>Si</td>
<td>110.20</td>
<td>12.06</td>
<td>Si</td>
<td>110.14</td>
<td>14.83</td>
</tr>
<tr>
<td>S</td>
<td>0.29</td>
<td>0.03</td>
<td>S</td>
<td>0.74</td>
<td>0.09</td>
</tr>
<tr>
<td>Cl</td>
<td>0.42</td>
<td>0.04</td>
<td>Cl</td>
<td>0.40</td>
<td>0.04</td>
</tr>
<tr>
<td>Ca</td>
<td>2.04</td>
<td>0.16</td>
<td>K</td>
<td>0.52</td>
<td>0.05</td>
</tr>
<tr>
<td>Cu</td>
<td>0.60</td>
<td>0.03</td>
<td>Ca</td>
<td>2.12</td>
<td>0.02</td>
</tr>
<tr>
<td>Zr</td>
<td>0.26</td>
<td>0.01</td>
<td>Fe</td>
<td>0.75</td>
<td>0.05</td>
</tr>
<tr>
<td>In</td>
<td>0.74</td>
<td>0.02</td>
<td>Cu</td>
<td>1.29</td>
<td>0.08</td>
</tr>
<tr>
<td>Total</td>
<td>551.81</td>
<td></td>
<td>Zn</td>
<td>1.00</td>
<td>0.06</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>Total</td>
<td>456.3</td>
<td></td>
</tr>
</tbody>
</table>

- In AGBP & AKBP showed the presence of nanoparticles.
- Some of the particles got fused with each other.
- Particles were not of similar shape.
- Agglomeration of particles was observed.

b) EDS: The Electron Dispersive Spectrometry makes use of the X-ray spectrum emitted by a solid sample bombarded with a focused beam of electrons to obtain a localized chemical analysis. **Qualitative analysis** involves the identification of the lines in the spectrum & **Quantitative analysis** (determination of the concentrations of the elements present) entails measuring line intensities for each element in the sample and for the same elements in calibration Standards of known composition.

3. **XRD Study**\(^7\): X-ray powder diffraction analysis (XRD) is a rapid analytical technique primarily used for phase identification of crystalline material (e.g. minerals, inorganic compounds) and can provide information on unit cell dimensions.
Fig 3: XRD peak for AGBP & AKBP

- AGBP & AKBP analyzed using X-ray diffraction shows peaks of SiO₂.
- AGBP crystalline size little different than AKBP.
- AGBP and AKBP there is no difference from standard d spacing of SiO₂ so it proves that it is standard composition of SiO₂.

9. UV Spectrometry ⁸:- It involves measuring the amount of ultraviolet radiation absorbed by a substance in solution. UV Absorption Spectra for AGBP & AKBP with Standard SiO₂ Data.

<table>
<thead>
<tr>
<th>Sample</th>
<th>λ₁ nm (Violet)</th>
<th>λ₂ nm (Green)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGBP</td>
<td>393</td>
<td>509</td>
</tr>
<tr>
<td>AKBP</td>
<td>391</td>
<td>504</td>
</tr>
</tbody>
</table>

- On the basis of preliminary test i.e. color of sample is reddish.
- Absorption spectra have been fitted by Gaussian function. It shows two prominent features in Violet and Green region.
- We can conclude here that this material reflect in red region, absorb in Green and violet region, where as it may transmit in middle-UV region ranges from 300 to 400 nm. These two absorption region are associated with the SiO₂ effect levels.
- The UV Spectrometry of AGBP and AKBP shows peaks of similar wavelength which means that, the amount of ultraviolet radiation absorbed by substances in both the solutions are similar.

Table 4: Absorption Spectra for AGBP & AKBP

CONCLUSION

a) Preparation of Akik Pishti shown the slight difference in colour and odour taste resemble as bhavna dravya of respective pishti.

b) Comparative analysis performed for preparational process for prepared sample with different analytical test for quantitative and qualitative analysis which has authenticated the drug and also checked many analytical tests to evaluate the difference. But there is slight difference in all analytical values.

c) Here, from all these studies it can be concluded that, different PISHTI DRAVY used in preparation of PISHTI, shows slight remarkable difference in physico-chemical properties of the Pishti.
REFERENCES


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