Original Research Article
Pharmacognostical and Pharmacocemical Parameters of Tablet Sutashekhara Rasa – Without Gold

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ABSTRACT
Tablet Sutashekhara Rasa (TSR) is an Ayurvedic, herbo-metal formulation prescribed widely for several conditions such as Acid peptic disorders, Pain in abdomen, Haemorrhage, Mental disorders etc. On analysis of pharmacodynamics of this compound it is basically Pitta corrective drug. Ardhavabhedaka (Migraine) is also one of the clinical morbidity which is manifested by vitiated Pitta/Rakta along with Vata. The available treatment in modern medicine is use of NSAIDs, Beta-blockers etc. with only temporary relief. TSR being a Pitta corrective is used in a clinical study with new indication in Ardhavabhedaka (Migraine). Till date there is no data available regarding evaluation of TSR. Present study an attempt to develop newer approaches for the quality control and standardization of TSR. The samples were subjected to organoleptic, physicochemical analysis and Chromatographic (HPTLC) examination by optimizing the solvent systems. The pharmacognostical study of ingredients of TSR shows the presence of Scleriform vessel, Lignified stone cells, Bottle necked shapedstone cells etc. Pharmaceutical analysis showed that the Average weight of tablet was 276mg, Average hardness of tablet was 2.05 Kg/cm², Loss on drying was 4.7904% w/w, pH value was 7 and High Performance Thin Layer Chromatography at 254nm and 366nm resulted into 6 spots.

Introduction
Tablet Sutashekhara Rasa (TSR) is an Ayurvedic medicine. It is a herbo-minaral formulation. It is indicated in the management of Acid peptic disorders, Pain in abdomen, Haemorrhage, Mental disorders etc. It is one such prime formulation which takes corrective action on the Pitta Dosha. A Sutashekhara Rasa- a powder formulation has been mentioned in YograitaSkara but for the present study the drug Sutashekhara Rasa has been converted into tablet (Vati) form for the sake of dose standardization and better therapeutic compliance[1].

Ardhavabhedaka in Ayurveda classics is severe headache hemicranial painful condition with episodic onset[2]. Very much similar clinical condition is referred as migraine in modern medical literature. Migraine is a Greek word derived from Hemicranions. Ardhavabhedaka (Migraine) is also one of the clinical morbidity which is manifested by vitiated Pitta/Rakta along with Vata. The available treatment in modern medicine is use of NSAIDs, Beta-blockers etc. with only temporary relief. TSR being a Pitta corrective is used in a clinical study with new indication in Ardhavabhedaka (Migraine). Till date there is no data available regarding evaluation of TSR. So a clinical trial was conducted with TSR in the management of Ardhavabhedaka (Migraine). In the present study TSR used for systemic treatment of Ardhavabhedaka (Migraine). The trial compound containing eighteen drugs which are Deepana, Pachana, Aampachana and Vedanashamaka. All contents are easily available. The compound is slightly modified to meet the cost factor as well as to verify the classical reference of alternate supplementation i.e. Swarna Bhasma will be replaced by SwarnaMakshika Bhasma[3]. It was inferred from the results that it gave promising result effect in the patient of Ardhavabhedaka (Migraine). Proper identification of raw materials at the basic level with the help of microscopic and morphological characteristics and adequate analytical methods are essential to ensure the quality and standards of the...
prepared medicine. With this background, TSR was subjected for pharmacognostical and pharmachemical analysis.

**Materials and Methods**

**Plant material**
The raw drug materials were collected from the pharmacy department, IPGT & RA, GAU, Jamnagar. Table-1

**Pharmacognostical Evaluation**
The raw drugs are identified and authentified and powder microscopy was done in the pharmacognosy department, IPGT & RA, GAU, Jamnagar. The study includes organoleptic evaluation and microscopic evaluation[4].

**Microscopic Study**
The individual powered drug are first examined under distilled water for the observation of calcium oxalate crystals and other cellular materials, then stained with Phloroglucinal and conc. HCl for the lignified characeter, then stained with iodine to observe the starch grains. Raw drugs were separately studied under microscope, the diagnostic characters microphotographs are taken by using Carl zeisstrinocular microscope[5,6].

**Organoleptic Study**
Contents of TSR were evaluated for organoleptic characters like taste, odour and colour etc[7].

**Pharmacoc-chemical evaluation**

**Physicochemical parameters**
TSR was analyzed at the pharmaceutical chemistry Laboratory of I.P.G.T. & R.A., Gujarat Ayurved University, Jamnagar. The common parameters mentioned for compressed tablets in Ayurvedic pharmacopoeia of India and CCRAS guidelines were considered for pharmaceutical evaluation. Presence of more moisture content in a sample may create preservation problem. Hence loss on drying was also selected as one of the parameters. TSR was further subjected to High Performance Thin Layer Chromatography (HPTLC) study[8-9].

**Results and Discussion**

**Microscopic Study**
Contents of TSR showed Sceleriform vessel and Simple starch grain of Sunthi, Blackish grey debris and Lignified stone cells of Maricha, Bottle necked shaped and Simple starch grain with hilum of Pippali, Stomata and Fragment of trichome of Dhatura, Lignified fiber and Group of stone cells of Twak, Unicellular simple trichome and Prismatic crystal of TamlaPatra, Coloring matter and Pollen grains of Nagkesra, Fiber with crystal and Stone cells of Bilva, Perisepm cells, Oil golbule and Prismatic crystal of Ela, Strach grains and Annular vessel of Shati, Stone cells with brown content and Prismatic crystal of Vatsanabha, Warty trichome and Spiral vessel of Bhringaraja.Plate no. 1(Figure no.1-24)

**Pharmaceutical evaluation**

**Organoleptic characters of TSR**
Organoleptic characters of Contents of TSR like texture, colour, taste and odour are recorded separately and are depleted shown in Table- 2.

**Physicochemical tests**
Physicochemical analysis of TSR revealed Average weight of tablet 276mg, Average hardness of tablet 2.05 Kg/cm², Loss on drying 4.7904% w/w, Water soluble extract 54.6% w/w, Methanol soluble extract 19.4% w/w, pH value 7 shown in Table- 3

**HPTLC study results**
Chromatographic study (HPTLC) was carried out under 254 and 366 nm UV to establish fingerprinting profile. It showed 6 spots at 254 nm and at 366 nm with Rf values were recorded which may be responsible for expression of its pharmacological and clinical actions. Plate-2, Table- 4.

Plate 1: Microphotographs of TSR

![Plate 1: Microphotographs of TSR](image1)

Figure-1 Sceleriform vessel –Sunthi

Figure-2 Simple starch grain –Sunthi
Figure-3 Blackish grey debris – *Maricha*

Figure-4 Lignified stone cells – *Maricha*

Figure-5 Bottle necked shaped – *Pippali*

Figure-6 Simple starch grain with hilum – *Pippali*

Figure-7 Fragment of trichome – *Dhatura*

Figure-8 Stomata – *Dhatura*

Figure-9 Lignified fiber – *Twak*

Figure-10 Group of stone cells – *Twak*
Figure-11 Unicellular simple trichome - *TamlaPatra*

Figure-12 Prismatic crystal - *TamlaPatra*

Figure-13 Pollen grains - *Nagkesra*

Figure-14 Coloring matter - *Nagkesra*

Figure-15 Fiber with crystal - *Bilva*

Figure-16 Stone cells - *Bilva*

Figure-17 Perisepm cells - *Ela*

Figure-18 Oil golbule, prismatic crystal - *Ela*
Figure-19: Strach grains - *Shati*

Figure-20: Annular vessel - *Shati*

Figure-21: Stone cells with brown content - *Vatsanabha*

Figure-22: Prismatic crystal - *Vatsanabha*

Figure-23: Warty trichome of *Bhringaraja*

Figure-24: Spiral vessel - *Bhringaraja*

**Plate 2: Densitogram OF TSRAT 254 AND 366NM**
Table 1: Ingredients of TSR

<table>
<thead>
<tr>
<th>No.</th>
<th>Sanskrit Name</th>
<th>Latin/English Name</th>
<th>Parts used</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ShuddhaParada</td>
<td>Pure Mercury</td>
<td>-</td>
<td>1 part</td>
</tr>
<tr>
<td>2</td>
<td>ShuddhaGandhaka</td>
<td>Pure Sulfur</td>
<td>-</td>
<td>1 part</td>
</tr>
<tr>
<td>3</td>
<td>ShuddhaTankana</td>
<td>Pure Borax</td>
<td>-</td>
<td>1 part</td>
</tr>
<tr>
<td>4</td>
<td>ShuddhaVatsanaabha</td>
<td>Aconitum ferox Wall ex seringe</td>
<td>Root</td>
<td>1 part</td>
</tr>
<tr>
<td>5</td>
<td>SwarnaMakshika</td>
<td>Copper pyrite calcinite</td>
<td>-</td>
<td>1 part</td>
</tr>
<tr>
<td>6</td>
<td>TamraBhasma</td>
<td>Copper calcinite</td>
<td>-</td>
<td>1 part</td>
</tr>
<tr>
<td>7</td>
<td>Suthti</td>
<td>Zingiber officinale Rose.</td>
<td>Rhizome</td>
<td>1 part</td>
</tr>
<tr>
<td>8</td>
<td>Krishna Maricha</td>
<td>Piper nigrum Linn.</td>
<td>Fruit</td>
<td>1 part</td>
</tr>
<tr>
<td>9</td>
<td>Pippali</td>
<td>Piper longum Linn.</td>
<td>Fruit</td>
<td>1 part</td>
</tr>
<tr>
<td>10</td>
<td>Dhatura</td>
<td>Datura metal Linn.</td>
<td>Leaves, Seed</td>
<td>1 part</td>
</tr>
<tr>
<td>11</td>
<td>Twaka</td>
<td>Cinnamomum zeylanicum Breyn</td>
<td>Stem-bark</td>
<td>1 part</td>
</tr>
<tr>
<td>12</td>
<td>TmalaPatra</td>
<td>Cinnamomum tamala Nees&amp;Eberm</td>
<td>Leaves</td>
<td>1 part</td>
</tr>
<tr>
<td>13</td>
<td>Nagakeshara</td>
<td>Mesuferrea Linn.</td>
<td>Pollen grains</td>
<td>1 part</td>
</tr>
<tr>
<td>14</td>
<td>Ela</td>
<td>Elettaria cardamomum Maton</td>
<td>Fruit</td>
<td>1 part</td>
</tr>
<tr>
<td>15</td>
<td>Bilva</td>
<td>Aeglemarmelous Corr.</td>
<td>Fruit</td>
<td>1 part</td>
</tr>
<tr>
<td>16</td>
<td>ShankhaBhasma</td>
<td>Couchchelcinite</td>
<td>-</td>
<td>1 part</td>
</tr>
<tr>
<td>17</td>
<td>Karchura</td>
<td>Curcuma zedoaria Rose.</td>
<td>Rhizome</td>
<td>1 part</td>
</tr>
<tr>
<td>18</td>
<td>Bhringaraja</td>
<td>Eclipta alba Hassk</td>
<td>Whole plant, seed</td>
<td>As per required</td>
</tr>
</tbody>
</table>

Table 2: Organoleptic characters of TSR

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Characters</th>
<th>Observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Colour</td>
<td>Blackish</td>
</tr>
<tr>
<td>2</td>
<td>Odour</td>
<td>Agreeable</td>
</tr>
<tr>
<td>3</td>
<td>Taste</td>
<td>Tasteless</td>
</tr>
</tbody>
</table>

Table 3: Pharmaceutical evaluation

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Uniformity of tablet</td>
<td>• Highest weight: 276 mg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lowest weight: 332 mg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Average weight: 246 mg</td>
</tr>
<tr>
<td>2</td>
<td>Tablet hardness</td>
<td>2.05 Kg/cm²</td>
</tr>
<tr>
<td>3</td>
<td>Loss on drying</td>
<td>4.7904% w/w</td>
</tr>
<tr>
<td>4</td>
<td>Water soluble extract</td>
<td>54.6% w/w</td>
</tr>
<tr>
<td>5</td>
<td>Methanol soluble extract</td>
<td>19.4% w/w</td>
</tr>
<tr>
<td>6</td>
<td>pH</td>
<td>7.00</td>
</tr>
</tbody>
</table>

Table 3: HPTLC of TSR

<table>
<thead>
<tr>
<th>Wavelength</th>
<th>Number of spots</th>
<th>RF values</th>
</tr>
</thead>
<tbody>
<tr>
<td>254nm</td>
<td>6</td>
<td>0.07, 0.15, 0.63, 1.30, 1.44, 1.84</td>
</tr>
<tr>
<td>366nm</td>
<td>6</td>
<td>0.07, 0.16, 1.26, 1.41, 1.58, 1.85</td>
</tr>
</tbody>
</table>

Conclusion

Pharmacognostical and Pharmaco-chemical evaluation of TSR illustrated the specific characters of ingredients which were used in the preparation. All the Pharmaceutical parameters analyzed within the permissible range. On the basis of observations and experimental results, the evaluation research of TSR may be used as standard reference for further research work and clinical studies.

Conflict of Interest statement
We declare that we have no conflict of interest.
References


4. Anonymous, the Ayurvedic Pharmacopoeia of India, Part-I, Vol. 1-4, Govt.bof India, Ministry of Health & Dept. of ISM and H. New Delhi; Dept. of Ayush; 1999; 155-56


