PHARMACOGNOSTICAL AND PHARMACEUTICAL ANALYSIS OF JIVANTYADI CHURNA

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ABSTRACT
Bronchial Asthma is a disease characterized by an increased responsiveness of the airways to various stimuli. It manifests by widespread narrowing of the airways causing paroxysmal dyspnea, wheezing or cough. Ayurveda texts have described five types of Shwasa Vyadhi and among these five, Tamaka is one. Tamaka Shwasa is a “Swatantra” Vyadhi. In Ashtanga Hridayam & Astanga Sangraha, the group of 18 drugs is mentioned for the management of the Shwasa Vyadhi named as Jivantyadi Churna. Methods- Final product was subjected to Pharmacognostical and physico-chemical analysis such as microscopic study, loss on drying, ash value, pH etc. Results- Pharmacognostical study showed the presence of contents such as; annular vessels of Shati, simple trichome of Tulsi, rossels crystal of Jivanti etc. Preliminary physico-chemical analysis showed that the loss on drying was found to be 8.4%, pH 7, Ash value 10%, Water soluble extract 6.8% etc. High Performance Thin Layer Chromatography (HPTLC) showed 4 and 2 spots at 254nm and 366nm respectively. Conclusion- The present work was carried out to standardize the finished product Jivantyadi Churna in terms of its identity, quality and purity. Pharmacognostical and Physico-chemical observations revealed the specific characters of all active constituents used in the preparation.

KEYWORDS: HPTLC, Pharmacognosy, Jivantyadi Churna, pharmaceutical, Tamaka Shwasa.

INTRODUCTION
The prevalence of Bronchial Asthma an estimated 4 to 7% of the people worldwide.[1] As stated by W.H.O, 350 million of global population are suffering from Bronchial Asthma, out of which 1/10 are Indians and the prevalence of asthma is increasing every year. It is one of the most important chronic conditions causing elementary school absenteeism in childhood.[2,3] Tamaka Shwasa is a “Swatantra” Vyadhi i.e. having its own etiological factor, patho-physiology and management. It is mentioned as Yapya Vyadhi in Charaka Samhita, while Sushruta considered it as KrichchraSadhya Vyadhi. Tamaka Shwasa is a disorder of Praanavah Srotas while other Srotasas are also involved. The parallel disease entity in modern medicine to this disorder is Bronchial Asthma. In Ashtanga Hridayam & Astanga Sangraha, Jivantyadi Churna, the group of 18 drugs is mentioned for the management of the Shwasa Vyadhi named as Jivantyadi Churna.[4] (Table 1) In the present day practice, among these 18 drugs most of the drugs are being used in different combinations. It prevent the attack of asthma due to anti-tussive, anti-inflammatory, mucolytic property etc. which is very useful to decrease the asthma prevalence. In the present study, the formulation is subjected to Pharmacognostical and pharmaceutical analysis. Preliminary organoleptic features and results of microscopy were verified and all the ingredients were proved to be authentic.

MATERIALS AND METHODS
Collection, Identification and Authentication of raw drugs
The raw materials were collected from the pharmacy of Gujarat Ayurved University, Jamnagar. All the raw drugs were identified and authenticated in the Pharmacognosy Department, Institute for Post Graduate Teaching and Research in Ayurveda, Gujarat Ayurved University, Jamnagar.

Preparation of the drug
As specific method of preparation is not mentioned for this drug, it was prepared as per common guidelines
described in classics and API for Churna formulation. Physico-chemical and qualitative analysis of the final product were carried out in the pharmaceutical chemistry laboratory of I.P.G.T & R.A., Gujarat Ayurved University, Jamnagar under expert guidance.

Pharmacognostical study
The Pharmacognostical study comprises of organoleptic study and microscopic study of finished product.

Organoleptic Study
The Organoleptic characters of Ayurvedic drugs are very important and give the general idea regarding the genuinity of the sample. Organoleptic parameters like Taste, Colour, odour and touch were scientifically studied in Pharmacognosy laboratory, I.P.G.T. & R.A., Gujarat Ayurved University, Jamnagar, Gujarat, India.[5]

Microscopic Study
Jivantyadi Churna was powdered and dissolved with water and microscopy of the sample was done without stain and after staining with Phloroglucinol + HCl. Microphotographs of Jivantyadi Churna was also taken under Corl-zeiss binocular microscope.[6]

Physico-chemical analysis
Jivantyadi Churna was analyzed using various standard physico-chemical parameters such as loss on drying, water soluble extract, alcohol soluble extract etc.[7]

High Performance Thin Layer Chromatography (HPTLC)
HPTLC was performed as per the guideline provided by API. Methanolic extract of drug sample was used for the spotting. HPTLC was performed using Toluene + Ethylacetate + Acetic acid (7:2:1) solvent system and observed under visible light. The colour and Rf values of resolved spots were noted.[8]

Table 1. Contents of Jivantyadi Churna.

<table>
<thead>
<tr>
<th>Sr.No</th>
<th>Drug name</th>
<th>Botanical name</th>
<th>Part to be used/ Shushka</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jivanti</td>
<td>Leptadenia reticulata W &amp; R</td>
<td>Shushka Panchanga</td>
<td>1 part</td>
</tr>
<tr>
<td>2</td>
<td>Nagarmotha</td>
<td>Cyperus rotandus Linn.</td>
<td>Shushka Kanda</td>
<td>1 part</td>
</tr>
<tr>
<td>3</td>
<td>Tulsi</td>
<td>Ocimum sanctum Linn.</td>
<td>Shushka Panchanga</td>
<td>1 part</td>
</tr>
<tr>
<td>4</td>
<td>Dalchini</td>
<td>Cinnamomum Cassia (L.)</td>
<td>Shushka Twaka</td>
<td>1 part</td>
</tr>
<tr>
<td>5</td>
<td>Badi elaichi</td>
<td>Amomum Subulatum Roxb.</td>
<td>Shushka Phala</td>
<td>1 part</td>
</tr>
<tr>
<td>6</td>
<td>Chhoti elaichi</td>
<td>Elettaria Cardamomum Maton.</td>
<td>Shushka Phala</td>
<td>1 part</td>
</tr>
<tr>
<td>7</td>
<td>Pushkararnoola</td>
<td>Indula racemos. Hook. F</td>
<td>Shushka Moola</td>
<td>1 part</td>
</tr>
<tr>
<td>8</td>
<td>Chanda</td>
<td>Angelica Archangeica Linn</td>
<td>Shushka Moola</td>
<td>1 part</td>
</tr>
<tr>
<td>9</td>
<td>Bhumyamalaki</td>
<td>Pityllthus Fraternal L.</td>
<td>Shushka Panchanga</td>
<td>1 part</td>
</tr>
<tr>
<td>10</td>
<td>Agaru</td>
<td>Acquilaria agallocha Roxb.</td>
<td>Shushka Kashha</td>
<td>1 part</td>
</tr>
<tr>
<td>11</td>
<td>Bharangi</td>
<td>Clerodendrum Serratum Linn.</td>
<td>Shushka Kanda Twaka</td>
<td>1 part</td>
</tr>
<tr>
<td>12</td>
<td>Shunthi</td>
<td>Zingiber Officiname Roscope.</td>
<td>Shushka Kanda</td>
<td>1 part</td>
</tr>
<tr>
<td>13</td>
<td>Shugandhabala</td>
<td>Pavonia odorata Wild.</td>
<td>Shushka Moola</td>
<td>1 part</td>
</tr>
<tr>
<td>14</td>
<td>Karkatshringi</td>
<td>Pistacia integerrima Stew.</td>
<td>Shushka Shrigakar Kosha</td>
<td>1 part</td>
</tr>
<tr>
<td>15</td>
<td>Kachura</td>
<td>Curcuma Zedoaria Rosc.</td>
<td>Shushka Kanda</td>
<td>1 part</td>
</tr>
<tr>
<td>16</td>
<td>Pippalimoola</td>
<td>Piper longum Linn.</td>
<td>Shushka Moola</td>
<td>1 part</td>
</tr>
<tr>
<td>17</td>
<td>Nagakeshar</td>
<td>Occhocarpus Longifolius Benth &amp; Hook.F.</td>
<td>Shushka Pushapa</td>
<td>1 part</td>
</tr>
<tr>
<td>18</td>
<td>Choraka</td>
<td>Angelica glauca Edgew.</td>
<td>Shushka Moola</td>
<td>1 part</td>
</tr>
</tbody>
</table>

RESULTS AND DISCUSSION

Organoleptic characters of Jivantyadi Churna
Organoleptic characters contents of Jivantyadi Churna like colour, taste, touch, Odor were recorded and shown in Table - 2.

Microscopic Study
Diagnostic characters of Jivantyadi Churna under the microscope showed annular vessels of Shati, simple trichome of Tulsi Rossels crystal of Jivanti, starch grain of Shati tannin content of Agaru Starch grain of Jivanti, pitted vessels of Tulsi etc. All these are shown in Plate no 1.

PHARMACEUTICAL EVALUATION

Physico-chemical analysis
Physico-chemical analysis of Jivantyadi Churna revealed the value of loss on drying was 8.4%, Ash value 10% w/w, water soluble extraction 6.8 % Alcohol soluble extraction 9.14 %, pH Value 7 are shown in Table – 3.

HPTLC Study
The chromatographic study (HPTLC) was carried out under 254 and 366 nm UV to establish fingerprinting profile. It showed 4 spots at 254 nm and 2 spots at 366 nm with Rf values were recorded which may be responsible for expression of its pharmacological and clinical actions. Plate 2, Table – 4.
Chanda, Choraka are not available in present era, so their substitutes will be used as given below:

<table>
<thead>
<tr>
<th>Main Drug</th>
<th>Substitute</th>
<th>Botanical name of substitute drug</th>
<th>Part to be used/ Shushka</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chanda</td>
<td>Shati</td>
<td>Hedychium spicatum. Ham ex smith</td>
<td>Shushka Kanda</td>
<td>1 part</td>
</tr>
<tr>
<td>Choraka</td>
<td>Talishpatru</td>
<td>Abies webbiana Lindl.</td>
<td>Shushka Patra</td>
<td>1 part</td>
</tr>
</tbody>
</table>

Table 2: Organoleptic parameters of Jivantyadi Churna.

<table>
<thead>
<tr>
<th>Serial no.</th>
<th>Character</th>
<th>Observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Colour</td>
<td>Light Brown</td>
</tr>
<tr>
<td>2</td>
<td>Odour</td>
<td>Characteristic sweet</td>
</tr>
<tr>
<td>3</td>
<td>Taste</td>
<td>Bitter</td>
</tr>
<tr>
<td>4</td>
<td>Touch</td>
<td>Fine</td>
</tr>
</tbody>
</table>

Table 3: Physico-chemical analysis of Jivantyadi Churna.

<table>
<thead>
<tr>
<th>Serial no.</th>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Loss on drying</td>
<td>8.4 %w/w</td>
</tr>
<tr>
<td>2</td>
<td>Ash value</td>
<td>10 %w/w</td>
</tr>
<tr>
<td>3</td>
<td>Water soluble extract</td>
<td>6.8 %w/w</td>
</tr>
<tr>
<td>4</td>
<td>Alcohol soluble extract</td>
<td>9.14 %w/w</td>
</tr>
<tr>
<td>5</td>
<td>pH</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 4: HPTLC Study of Jivantyadi Churna.

<table>
<thead>
<tr>
<th>Wave Length</th>
<th>Number of spots</th>
<th>Rf values</th>
</tr>
</thead>
<tbody>
<tr>
<td>254nm</td>
<td>4</td>
<td>0.02, 0.12, 0.16, 0.24</td>
</tr>
<tr>
<td>366nm</td>
<td>2</td>
<td>0.02, 0.16</td>
</tr>
</tbody>
</table>

Plate no 1.
Plate No.2

Fig. 21

Fig. 22

Fig. 23

Fig. 24

Fig. 25

Fig. 26

Fig. 27

Fig. 28

Fig. 29

Fig. 30

Fig. 31

Fig. 32

Fig. 33

Fig. 34

Fig. 35

Fig. 36

Fig. 37

Fig. 38

Fig. 39

Fig. 40
Powder Microscopy
Fig.1– Powder sample.
Fig.2– Boarded pitted vessel of Pushkaramoola.
Fig.3– Silica deposition of nagarmotha.
Fig.4– Yellow colouring matter with all globules of nagakeshar.
Fig.5– Oval shape starch grain of shunthi.
Fig.6– Small group of starch grain of kachura.
Fig.7– Circular shape starch grain of nagarmotha.
Fig.8– Animal excreta (black debris) of Karkatshringi.
Fig.9– Group of fibre of pushkaramoola.
Fig.10– Brown contain of dalchini.
Fig.11– Stone cells with Agaru.
Fig.12– Prismatic crystal of jivanti.
Fig.13– Fibre with yellow contain of shunthi.
Fig.14– Scalariform vessel of shati.
Fig.15– Group of sclereids of Karkatshringi.
Fig.16– Cork cells of pippalimoola.
Fig.17– Rosette crystal of bharangi.
Fig.18– Group of starch cell Shugandhabala.
Fig.19– Group of stone cells of pippalimoola.
Fig.20– Rhomboid crystal of jivanti.
Plate No. 2

Powder Microscopy

Fig. 21–Oleoresin contain of shati.
Fig. 22–Fibre and vessels of pipalimoola.
Fig. 23–Fibre of jivanti.
Fig. 24–Boarded pitted vessel of bhumyalaki.
Fig. 25–Hypodermis of badi elaichi.
Fig. 26–Epicarp cells with oil globule of ela.
Fig. 27–Cork cells of brown cells of pushkaramoola.
Fig. 28–Starch grain and brown contain of shati.
Fig. 29–Pollen grain of nagakeshar.
Fig. 30–Ergastic cells of Karkatshringi.
Fig. 31–Parenchyma cells of nagarmotha.
Fig. 32–Brown contain of karkatshringi.
Fig. 33–Prismatic crystal of pushkarmoola.
Fig. 34–Fibre with brown contain of talishpatra.
Fig. 35–Group of small starch grain of Badi elaichi
Fig. 36–Trichome of Tulsi
Fig. 37–Spiral vessel of Bhumyalaki
Fig. 38–Lignified group of fibre of pushkaramoola
Fig. 39–Lignified stone cells of dalchini
Fig. 40–Lignified group of septated fibre of bharangi

Plate No. 3

Powder Microscopy

Fig. 41–Lignified fibre of jivanti
Fig. 42–Lignified pitted stone cell of jivanti
Fig. 43–Lignified pitted stone cell of agaru
Fig. 44–Epicarp cell of badi elaichi
Fig. 45–Lignified pitted stone cell of dalchini
Fig. 46–Scalariform and pitted vessel of shati

Plate 2: Densitogram of Jivantyadi Churna at 254 nm and 366 nm.

Peak display at 254nm  Peak display at 366 nm
CONCLUSION
The pharmacognostical and physico chemical analysis of Jivantyadi Churna confirmed the purity and genuinity of the drug. Further studies may be carried out on it on the basis of observation made and results of experimental studies. As pharmacognostical and physico-chemical profiles of Jivantyadi Churna are available this study may be beneficial for future researchers and can be used as a reference standard in the further quality control researchers.

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