Original Research Article
Pharmacognostical and phytochemical standardization of Baladi churna- A polyherbal formulation

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ABSTRACT
Baladi Churna described by Acharya Bhavprakash in Vandhyatva (infertility). Endometrium dysfunction is the prime cause of Infertility among the world Baladi Churna is useful in patients especially having implantation failure due to defective endometrium, which is known as Kshetra deformity in Ayurveda. So a new pharmaceutical preparation Baladi churna was tried to standardize which is economical in terms of time and machinery usage. The present work was carried out to standardize the finished product of to confirm Baladi Churna entity, quality and purity. The presence of trichomes, spiral vessels, pollen grains were the characteristic features observed in the microscopy of the prepared drug. Phyto-chemical analysis showed Loss on drying 8.24% w/w, ash value 9 %w/w, water soluble extract 46.3 % w/w & pH 6.5. HPTLC of Baladi Churna is the preliminary quantitative analysis which shows 11 prominent spots in UV 254 nm and 10 prominent spots 366 nm. Baladi Churna, a polyherbal formulation of 6
ingredients was prepared and HPTLC finger print profile was developed and it can be considered pharmacopial standard of *Baladi Churna*.

**Introduction**

The ancient science, *Ayurveda* has its own holistic aim to make the mankind delightful. Endometrial factor is an important subset in infertility among women, which resembles as *Kshetra*, one of four essential factors for conception define in *Ayurveda*. Endometrium works as bed for implantation of fertilized ovum, as *Kshetra* for germination of seed. Decreased endometrial receptivity is principal cause of implantation failure, which contributes 23% among the various causes of repeated abortio [1]. IVF Success rate was only 35%, rest 65% cases of IVF failed because of implantation failure in which decreased endometrial receptivity is commonest cause of implantation failure[2]. *Baladi Churna*[3] mentioned by *Acharya Bhavaprakash* containing medicine with *Balya, Punsavan* and *Vrishya* properties was selected for the study.

In the era of technology, when the manufacturing of *Ayurvedic* drugs become the part of industrial business, then the standard parameters to check the market quality of drugs should be necessary then and then by the invincible *Ayurvedic* science, treatment will be found efficacious. In order to make sure the safe use of these medicines, a necessary first step is the establishment of standards of authentication and quality. Keeping these facts in consideration, present study has been undertaken to develop the pharmacognostical and phytochemical profile of *Baladi Churna*.

**Materials and Methods**

**Collection of raw materials**

The raw drugs for the study were procured from the Pharmacy of Gujarat Ayurved University, Jamnagar. The final product i.e. *Baladi Churna* was prepared in the Pharmacy of Gujarat Ayurved University, Jamnagar. The ingredients and parts used in the formation of *Baladi Churna* are listed in (Table 1.)

**Pharmacognostical Evaluation**

**Organoleptic Study**

Organoleptic characters like texture, taste, odour and colour etc. of *Baladi Churna* powder was evaluated in this study [4](Table 2).

**Microscopic Study**

The *Baladi Churna* was dissolved in small quantity of distilled water, first observed without stain then stained with phloro-glucinol and concentrated HCl. Powder microscopy of *Baladi churna* compound powder was also carried out and microphotographs were taken by Carl zeiss trinocular microscope [5].

**Phyto-chemical analysis of drug**

*Baladi churna* was analyzed by using qualitative and quantitative parameters at Pharmaceutical Chemistry Laboratory, Institute for Post Graduate Teaching & Research in Ayurveda, Gujarat Ayurved University, Jamnagar, India. Phyto-chemical analysis of drug were carried out by Loss on Drying, Ash Value (AV), Water Soluble Extractive (WSE), Methanol Soluble Extractive (MSE), pH Value, High Performance Thin Layer Chromatography [6-11 ]. (Table No. 3)

**Results and discussion**

**Organoleptic Parameters**
The organoleptic characters of Ayurvedic drugs are evaluating the qualities of preparation by color, touch, fineness, taste, odor, etc. were noted through Jyanendriya (sense organs) and it is providing the idea about the quality of different formulations without using chemical tests. The final product was made of fine powder form. Organoleptic Parameters of the formulation are mentioned in Table 2.

These characters are corresponds to the all active ingredients among which most of have Madhura and tikta Rasa.

Pharmacognostical evaluation

Diagnostic characters of finished product under the microscope were seen and presence of all ingredients showed their different characters. Pitted vessels, Trichomes, Prismatic crystals of Atibala. Pollen grains of Nagakesar. Parenchyma cells, tannin contant cells and pollen grains of Madhuka. Tannin content spiral vessels and crystals of Vatashrung were observed. (Plate 1 Fig A-L)

Physico-chemical parameters

*Baladi Churna* was evaluated for various physico-chemical parameters. The results are shown in Table 3.

**High performance thin layer chromatography (HPTLC)**

11 prominent spots in UV 254 nm and 10 prominent spots 366 nm. Among 8 spots in both wavelength were common. Results are tabulated in Table-4. Densitometry at both wave length shown in picture (Plate 2 A & B).

### Table No. 1: Ingredients of *Baladi churna*

<table>
<thead>
<tr>
<th>Content</th>
<th>Latin Name</th>
<th>Part used</th>
<th>Ratio</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Bala / Atibala</em>*</td>
<td><em>Sida cordifolia</em> Linn. or <em>Abutil on indicum</em> Linn.</td>
<td>Root</td>
<td>1</td>
<td>Churna</td>
</tr>
<tr>
<td><em>Sita</em></td>
<td></td>
<td></td>
<td>1</td>
<td>Churna</td>
</tr>
<tr>
<td><em>Atibala</em></td>
<td><em>Abutil on indicum</em> Linn.</td>
<td>Root</td>
<td>1</td>
<td>Churna</td>
</tr>
<tr>
<td><em>Madhuka</em></td>
<td><em>Madhuka indica</em> J.F. Gmd</td>
<td>Flower</td>
<td>1</td>
<td>Churna</td>
</tr>
<tr>
<td><em>Vata Shung</em></td>
<td><em>Ficus begalensis</em> Linn.</td>
<td>Shung</td>
<td>1</td>
<td>Churna</td>
</tr>
<tr>
<td><em>Nagkesar</em></td>
<td><em>Ochrocarpus longifolius</em> Benth. &amp; Hook.f.</td>
<td>Stamens</td>
<td>1</td>
<td>Churna</td>
</tr>
</tbody>
</table>

### Table No. 2: Organoleptic Parameters of *Baladi Churna*

<table>
<thead>
<tr>
<th>Properties</th>
<th>Baladi Churna</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>(Rupa)</em> Colour</td>
<td>Whitish brown</td>
</tr>
<tr>
<td><em>(Rasa)</em> Taste</td>
<td>Started with sweet end with bitter</td>
</tr>
<tr>
<td><em>(Gandha)</em> Odour</td>
<td>Fruity</td>
</tr>
<tr>
<td><em>(Sparsha)</em> Touch</td>
<td>Course</td>
</tr>
</tbody>
</table>

### Table No. 3 Physico-Chemical parameters of *Baladi Churna*

<table>
<thead>
<tr>
<th>Sr.NO</th>
<th>TEST</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Loss on drying</td>
<td>8.245%</td>
</tr>
<tr>
<td>2</td>
<td>Ash value</td>
<td>8.9% w/w</td>
</tr>
<tr>
<td>3</td>
<td>Water soluble extract</td>
<td>46.3% w/w</td>
</tr>
<tr>
<td>4</td>
<td>Methanol soluble</td>
<td>32.5% w/w</td>
</tr>
<tr>
<td>5</td>
<td>Particle consistency</td>
<td>A.Above 60 mesh</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B.Between 60-85 mesh</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C.Between 85-120 mesh</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D.Below 120 mesh</td>
</tr>
</tbody>
</table>
6 pH 6.5

Table 4: HPTLC of Bladi Churna

<table>
<thead>
<tr>
<th>No. of spots</th>
<th>Rf Value</th>
<th>No. of spots</th>
<th>Rf Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>0.01, 0.04, 0.09, 0.13, 0.15, 0.39, 0.41, 0.50, 0.72, 0.95.</td>
<td>11</td>
<td>0.01, 0.04, 0.09, 0.15, 0.34, 0.39, 0.41, 0.50, 0.72, 0.77, 0.98</td>
</tr>
</tbody>
</table>

Discussion
Pharmacognostic study revealed that the presence of all the ingredients microscopic characters this show that the quality of the finished product. All the pharmaceutical parameters analysed showed values within permissible limit. Loss on drying method is applied to determine the amount of water, all or a part of water for crystallization, or volatile matter in the sample. Loss on drying of test drug is 8.245% w/w. Total ashes are designed to measure the total amount of material remaining after ignition. It includes both physiological and non-physiological ash (residue of the extraneous matter etc. adhering to the plant substance) Ash value of powder is 8.9% w/w. Thin layer chromatography is the most common form of chromatographic method used by Ayurvedic research workers to detect the number of compounds present in a product. It also helps to determine the purity of the sample.

Conclusion
Pharmacognostical and phyto-chemical evaluation of Baladi churna illustrated the specific characters of all ingredients which were used in the preparation. The pharmacognostical and phyto-chemical analysis of Baladi churna provides substantial information for the proper identification, authentication, and scientific evaluation of the final product/drug. On the basis of observations made and results of studies, this study may be beneficial for future researchers and can be used as a reference standard in the further quality control researches.

Plate 1: Micrphotographs of Baladi Churna

A. Stellate trichome of Atibala
B. Pollen grains of Maduka
C. Prismatic crystal of Atibala
D. Pollen grains of Nagakesar
E. Simple trichome of Atibala
F. Pitted vessel of Atibala
<table>
<thead>
<tr>
<th>A. Spiral Vessels of Vata Shung</th>
<th>B. Tannin content of Vatashrung</th>
<th>C. Compond starch grains of Atibala</th>
</tr>
</thead>
<tbody>
<tr>
<td>D. Tannin content of Madhuka</td>
<td>E. Stone cell of Vatashrung</td>
<td>F. Parenchyma cells of Madhuka</td>
</tr>
</tbody>
</table>

**Plate 2: Densitogram of Baladi Churna**

A. At 254 nm wavelength  
B. At 366 nm wavelength

**Acknowledgement**


**Conflict of interest statement**

We declare that we have no conflict of interest.
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