A Pharmacognostical and Physicochemical Evaluation of Bhringraj Vati

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ARTICLE INFO

Background: Since the past decades, there has been increasing acceptance and public interest in herbal products and therapies in both developing and developed countries. So, we cannot assure pharmaceutical industries insulation from adulterations and quality decrement. Therefore, quality control for the efficacy and safety of herbal products is a prime concern. Bhringraj is a plant of immense value. It is a plant from the family Asteraceae. Besides curing diseases, it also improves general health. Bhringaraj Vati is not mentioned in any classics. It is an Anubhuta drug formulated for the treatment of the metabolic syndrome.

Objective: The present study is aimed at setting up a standard profile of Bhringaraj Vati through Pharmacognostical and Physicochemical parameters.

Methods: Raw drugs identification and authentication were done by pharmacognostical study, i.e., morphological features, organoleptic characters, and powder microscopy. The physicochemical evaluation was carried out of the final product.

Results & conclusion: Pharmacognostical study of raw drugs showed the presence of starch grain, trichome with a smooth surface, collapse spongy parenchyma, fibers with the wide lumen, micro-crystals, etc. Pharmaceutical evaluation showed results PH 7, loss on drying 7.5% w/w, Ash value 35% w/w, Acid insoluble ash 19.5% w/w. Water-soluble extract 15.9% w/w, Methanol Soluble Extract 9.36 % w/w, Hardness 2.35 kg/cm². The result of the present study will also serve as reference standards in the preparation of drug formulation.

Keywords: Bhringaraj Vati, Pharmacognosy, Physico-chemical analysis.

1. INTRODUCTION

Metabolic syndrome is a constellation of hazardous risk factors, provides a favorable stage for developing cardiovascular disease, particularly heart failure and type 2 diabetes mellitus. Recent epidemiological studies on
metabolic syndrome, have shown that the prevalence of metabolic syndrome increases with age. In the USA, the prevalence of the metabolic syndrome is estimated 34% of the adult population. Diet, exercise, and medications can help to improve this condition.

Metabolic syndrome seems to be alike Rasavaha Srotodusti & Medavahasrotasa Dusti mentioned in Ayurveda. The manifestation of both Srotodusti occurs as a group of symptoms of Astithula and Purvarupa of Prameha, suggest the underlying hampered uptake and metabolism mechanism of glucose and fat. The causes of metabolic syndrome like inactive lifestyle, excessive fatty diet, alcohol, and lack of exercise, day time sleep are similar to the causes of Rasavaha Srotodusti & Medavaha Srotodusti, forced to believe both metabolic syndrome and both Rasavaha Srotodusti & Medavaha Srotodusti to be originated from the same source. The consumption of causative factors of both Rasavaha Srotodusti & Medavahasrotasa Dusti, vitiate Agni especially Rasadhatvagni & Medadhatvagni, produce Aama and excessive Meda resulting in obstruction of Vata, which can result in further complications and progression of the disease. Metabolic syndrome is a lifestyle disorder occurring due to faulty lifestyle. Lifestyle modification or correction is the primary and utmost intervention for prevention and treatment of such diseases. Bhringaraj Vati is not mentioned in any classics. It is an Anabхuta drug formulated by giving seven Bhavanas of Bhringaraj Swaras to Bhringaraja Churna. Standardization of drug means confirmation of its identity and determination of its quality and purity to justify their acceptability in modern system of medicines.

2. MATERIALS AND METHODS

Collection of Raw Drugs:
Bhringraj Churna was collected from local market where-as fresh Bhringraj was collected from the local area near Jamnagar. Bhringraj Swaras was extracted in the Pharmacy of Gujarat Ayurved University, Jamnagar.

Table 1: Botanical name & part used

<table>
<thead>
<tr>
<th>Sanskrit name</th>
<th>Botanical name</th>
<th>Part used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bhringraj</td>
<td>Eclipta alba Hassk</td>
<td>Panchanga</td>
</tr>
</tbody>
</table>

- Preparation of Bhringraj Vati:
Take fine powder (#120) of Bhringraj Churna. Then seven Bhavana of Bhringaraj Swaras should be given separately one by one for one day each. Then Vati was prepared. Then after it was stored in an airtight container. The whole process of Vati preparation was done at the Pharmacy of Gujarat Ayurveda University, Jamnagar under a sterile environment.

- Pharmacognostical Evaluation:
The raw drug was identified and authenticated by the Pharmacognosy laboratory, I.P.G.T. & R.A., Gujarat Ayurved University, Jamnagar. The identification was carried out based on organoleptic characters and powder microscopy of the drug. Powdered tablets of the drug were subjected to organoleptic and microscopic evaluation separately and confirmed the genuineness of the raw drug. The tablets were dissolved in the distilled water, filtered, air dried and studied under the corl Zeiss Trinocular microscope attached with a camera with stain and without stain. The microphotographs were also taken under the microscope.

Physicochemical parameters
The drug was analyzed by using qualitative and quantitative parameters at Pharmaceutical Chemistry Laboratory of I.P.G.T. & R.A., Gujarat Ayurved University, Jamnagar. Physical tests like the average weight of Vati, average hardness, loss on drying, ash value, insoluble acid ash, PH, and chemical tests like water-soluble extractive, methanol soluble extractive were taken.

HPTLC
Methanol extracts of drugs were spotted on pre-coated silica gel GF 60254 aluminum plates as 5mm bands, 5mm apart and 1cm from the edge of the plates, using a Camag Linomat V sample applicator fitted with a 100 L Hamilton syringe. Toluene (7 ml), Ethyl acetate (2 ml), Acetic acid (1 ml) was used as the mobile phase. After development, Densitometric scanning was performed with a Camag T.L.C. scanner III in reflectance absorbance mode at 254 nm and 366 nm under control of win CATS software (V 1.2.1 Camag). The slit dimensions were 6 mm x 0.45 mm, and the scanning speed was 20 mm s-1.

3. OBSERVATIONS & RESULTS

Pharmacognostical evaluation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Dark grey</td>
</tr>
<tr>
<td>Odor</td>
<td>Characteristic</td>
</tr>
<tr>
<td>Taste</td>
<td>Bitter astringent</td>
</tr>
<tr>
<td>Touch</td>
<td>Hard, Solid</td>
</tr>
</tbody>
</table>

Microscopic evaluation:
Diagnostic powder characters of Vati shows Fibers become shorter with smooth surface, Simple starch grain, Trichome with smooth surface, Drastic damage on epidermal cell & stomata, collapse spongy Parenchyma, Fibers with wide lumen, Micro-crystals, disturbed fragment of wavy parenchyma, Disturbed parenchyma cells with chlorophyll pigment, Drastic disturbed pollen grains, Fragment of disturbed annular pilar vessels. (Plate 1. 1-12).

Physico-chemical Parameters:
Physico-chemical parameters of Bhringraj Vati like total ash value, water-soluble extract, soluble methanol extract, ph 5% v/w aqua solution, loss on drying, average weight, hardness all were found to be within the normal range.

Details are given in Table 3.

<table>
<thead>
<tr>
<th>Sr no.</th>
<th>Parameters</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Loss on Drying at 110 c</td>
<td>7.5 % w/w</td>
</tr>
<tr>
<td>2</td>
<td>Total Ash value</td>
<td>35 % w/w</td>
</tr>
<tr>
<td>3</td>
<td>Acid-insoluble Ash</td>
<td>19.5% w/w</td>
</tr>
</tbody>
</table>
Table 4: Results of HPTLC of Bhringraj Vati

<table>
<thead>
<tr>
<th>Track</th>
<th>Solvent system</th>
<th>Observation under UV radiation</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>254 nm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No. of spots</td>
</tr>
<tr>
<td>Bhringraj Vati</td>
<td>Toluene (7ml) : Ethyl acetate (2ml) : Acetic acid (1ml)</td>
<td>11</td>
</tr>
</tbody>
</table>

4. DISCUSSION

The pharmacognostic evaluation showed that organoleptic characters of the sample were dark grey in color, characteristic odor, bitter astringent in taste, hard and solid in touch. Microscopically study showed that fibers, simple starch grain, trichome, epidermal cell, stomata, parenchyma, micro-crystals, wavy parenchyma, parenchyma cells with chlorophyll pigment, pollen grains, annular spiral vessels show that the ingredient was present in the finished product and also proven that the purity of the finished product. The physicochemical parameters play an important role in the standardization of formulation. According to the present study, the total ash is particularly important in the evaluation of purity of drugs, i.e., the presence or absence of foreign matter such as metallic salts or silica. According to API the total ash value of Bhringraj Churna should not be more than 22%. But here the total ash value of the final product is higher, i.e., 35%. The amount of Acid insoluble matter present in the product i.e.19.5% w/w. According to API, the Acid insoluble ash value of Bhringraj Churna should not be more than 11%. But here the total Acid insoluble ash value of the final product is higher, i.e., 19.5%. Here we can assume that these value changes due to the seven Bhavana of Bhringraj Swaras given during preparation of Vati. The water-soluble extractive values (15.9% w/w) indicated the presence of sugar, acids, etc. The loss on drying at 105°C was 10.25% w/w. The pH from 7% w/v solution revealed that pH of formulation was comparable and was neutral. The Hardness (2.35 kg/cm²) of a Vati is a function of how much pressure has been exerted in making it, and it varies with the composition, thickness, shape, and diameter of tablets.
Fig 4: Chromatographic separation at day light, at 254 nm and at 366 nm

5. CONCLUSION
From the present investigation, various standardization parameters such as Physicochemical standards, Pharmacognostical Evaluation were carried out; it can be concluded that the formulation of Bhingraj Vati contains all good characters of an ideal Vati and it was found to be more effective and economic. The study shows that the content of formulation is of good quality and purity. The result of the present study will also serve as reference standards in the preparation of drug formulation and also helpful in further clinical researches.

6. REFERENCES

Conflict of Interest: None
Source of Funding: Nil