A Pharmacognostical and Pharmaceutical evaluation of Dhanyamla

Research Article

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Abstract

Introduction: Dhanyamla is a medicated liquid preparation produced by fermentation process of various grains. Dhanyamla is cold at perception by its nature as it is a sour liquid and Ayurvedic classics opine that amla rasa is of cold nature if used externally. It is commonly used for management of Diabetic Polyneuropathy which commonly presents with burning sensation, loss of strength, loss of balance, loss of sensation, numbness etc. especially of feet. Materials and methods: Raw drugs of Dhanyamla as per the reference in Sahasrayogam were purchased from the local market of Jamnagar, Gujarat. It was prepared as per the standard preparation procedure at Department of Rasa shastra and Bhaishajya kalpana, IPGT&RA, GAU, Jamnagar. The final product was then subjected to pharmacognostical and pharmaceutical analysis. Pharmacognosy of Dhanyamla was carried out by preparing a slide made with glass slide and cover slip. Then this slide was observed under the Carl Zeiss Trinocular microscope. Organoleptic characters and physico-chemical parameters were noted. HPTLC was performed and observed under short UV (254 nm) and long UV (366 nm) respectively. Results: Pharmacognosy study of Dhanyamla revealed presence of starch content and oil globules. Analytical study of Dhanyamla showed 14 spots and 20 spots at 254 nm and 366 nm respectively. Specific Gravity, pH and total solid contents were 1.0033, 3.257 and 55.334 respectively. Discussion and conclusion: The presence of both carbohydrate and oil content would have been the reason of having soothing and mild nourishing effect.

Key Words: Dhanyamla, Pharmacognosy, Pharmaceutics.

Introduction

Dhanyamla is a medicated liquid preparation produced by fermentation process of various grains. Sometimes it also consists of certain medicines to have additive effect on some medical conditions. Dhanyamla gets its properties on the basis of, first its ingredients and secondly because of the fermentation process. Major part of it consists of various kinds of grains due to which it becomes nutritional.

Dhanyamla is cold at perception by its nature as it is a sour liquid and Ayurvedic classics opine that amla rasa is of cold nature if used externally but is of hot nature if used internally.(1) Thus if Dhanyamla is used externally for Pariseka etc. it reduces Pitta. Clinically this property is used in various Pitta janya diseases like burning sensation in various parts of body, etc. if used internally it is said to be laghu, bhedina, teekshna, ushna, pacifies Vata and Kapha, trishna hara.(2) It improves taste and appetite, reduces fatigue and lassitude. Due to such properties it used both internally and externally for purpose of pana, kavala, gandusha, basti, dhara, avagaha etc.

Dhanyamla is commonly used for management of Diabetic Polyneuropathy which commonly presents with burning sensation, loss of strength, loss of balance, loss of sensation, numbness etc. especially of feet. This condition is mainly Vata-Pitta pradhana and Kapha in the background which is mainly responsible for Prameha/Madhumeha. Keeping this in mind local Dhanyamla dhara/pariseka is used to mitigate the above symptoms of diabetic polyneuropathy. Now to understand the mechanism of Dhanyamla as how does it successfully mitigate neuropathy an attempt has been made to get some clue in understanding the liquid as a whole in terms of its microscopic analysis and physico-chemical analysis. Addition to this pharmacognosy of Dhanyamla was done to authenticate the ingredients used.

Materials and Methods

Collection of raw drugs

Raw materials required for preparation of Dhanyamla were purchased from the local market of Jamnagar, Gujarat. The ingredients and parts used in the preparation of the final products are listed in Table No. (1). After collection and proper cleaning of all the ingredients, Dhanyamla was prepared at Department of Rasa shastra and Bhaishajya kalpana, IPGT&RA, GAU, Jamnagar.
Table 1 - Contents of Dhanyamla (3)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Ingredients</th>
<th>Parts used</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tandula (Oryza sativa L.)</td>
<td>Dehusked rice grains</td>
<td>10 Prastha (7680 gms)</td>
</tr>
<tr>
<td>2</td>
<td>Pruthuka (Pressed form of Oryza sativa L.)</td>
<td>Pressed Rice</td>
<td>10 Prastha (7680 gms)</td>
</tr>
<tr>
<td>3</td>
<td>Kodrattha (Dolichus biflorus Linn.)</td>
<td>Seeds</td>
<td>40 Pala (1920 gms)</td>
</tr>
<tr>
<td>4</td>
<td>Laja (Puffed form of Oryza sativa L.)</td>
<td>Puffed Rice</td>
<td>40 Pala (1920 gms)</td>
</tr>
<tr>
<td>5</td>
<td>Kangubejja (Panicum sumatrense Roth ex Roem. &amp; Schult.)</td>
<td>Seeds</td>
<td>1 Adhaka (3072 gms)</td>
</tr>
<tr>
<td>6</td>
<td>Kudrava (Paspalum scrobiculatum L.)</td>
<td>Seeds</td>
<td>4 Prastha (3072 gms)</td>
</tr>
<tr>
<td>7</td>
<td>Nagara (Zingiber officinale Roscoe.)</td>
<td>Rhizome - fresh</td>
<td>2 Prastha (1536 gms)</td>
</tr>
<tr>
<td>8</td>
<td>Nimbuka (Citrus medica L.)</td>
<td>Fruit - whole</td>
<td>2 Adhaka (6144 gms)</td>
</tr>
<tr>
<td>9</td>
<td>Deepyaka (Trachyspermum ammi L.) Sprague ex Turrill</td>
<td>Seeds</td>
<td>8 Kudava (1536 gms)</td>
</tr>
<tr>
<td>10</td>
<td>Water</td>
<td>--</td>
<td>200 Prastha (153.6 lit.)</td>
</tr>
</tbody>
</table>

Preparation of Dhanyamla

First of the prescribed quantity of water was taken in a big steel vessel and was kept over a stove for heating. Then all the ingredients were added to the water filled vessel. The water was heated until it was luke warm and not boiled. Then luke warm water with all the ingredients in whole form were poured into a big clean porcelain vessel inside of which was pre fumigated. Then the vessel was closed properly and sealed. The liquid was now allowed to undergo fermentation process. Dhanyamla was checked for fermentation by means of match stick test and production of proper gandha (odour). Fermentation was completed in 15 days. After completion of the fermentation process the liquid was filtered and transferred into a clean vessel for storage.

Pharmacognostical study

Dhanyamla was observed and authenticated by the Pharmacognosy department of the institute. The identification of individual drugs was done on the basis of microscopic features of the finished product. Here, pharmacognostical evaluation of Dhanyamla was carried out by preparing a slide made with glass and cover slide. Then this slide was observed under the Carl Zeiss Trinocular microscope. The microscope was attached with a camera. Then photographs of Dhanyamla slide (finished product) at 40x magnification were taken without staining and after that with-staining (phloroglucinol and HCl staining).

Organoleptic Study

Dhanyamla liquid was observed for the organoleptic characters like color, odor and taste at the pharmacognosy laboratory of the institute.

Pharmaceutical Evaluation

Dhanyamla was subjected to testing of certain important Physico-chemical parameters (4) (as per API) at the institutional pharmaceutical laboratory; like specific gravity, pH and total solid contents to understand characteristics of this medicated liquid. These may be helpful in understanding its mode of action especially on its application externally as a mode of Pariseka sweda in cases of diabetic polyneuropathies, etc.

High Performance Thin Layer Chromatography (HPTLC) (8)(9)(10) study of Dhanyamla was performed by using Toluene: Ethyl acetate (9:1 v/v) solvent system and observed under short UV (254 nm) and long UV (366 nm). The instruments and methods were as under,

- Application Mode : CAMAG Linomat 5-Applicator
- Filtering System : Whatman Filter paper No.1
- Stationary Phase : MERCK HPTLC Silica Gel 60 F254
- Application (Y axis) : 10mm
- Start Position
- Sample Application Volume
- Development Mode : CAMAG TLC Twin Trough Chamber
- Chamber Saturation Time : 30 Minutes
- Mobile Phase : Petroleum ether: Diethyl ether : Acetic acid
- (9:1:0.1v/v)
- Visualisation : @254nm, @366nm and (after derivatization)
- Derivatization Mode : CAMAG - Dio tank for about 1 minute
- Drying Mode, Temperature : TLC Plate Heater preheated at 100±50°C
- Drying Time : 3 Minutes

Results

Characteristics of Dhanyamla: Microscopic evaluation of Dhanyamla was conducted and microphotographs were taken as seen, Photo - 1.1 Dhanyamla liquid, Photo - 1.2 Starch grains of Rice, Photo - 1.3 Stained starch grains of Pruthuka, Photo - 1.4 Stained starch grains of Kudrattha, Photo-1.5 Starch grains of Laja, Photo - 1.6 Starch grains of Kangu beeja, Photo-1.7 Starch grains of Kudrava, Photo - 1.8. Starch grains of Shunti, Photo-1.9 Oil globule of Citrus, Photo - 1.10 Epidermal cells with oil globule of Ammi.
Organoleptic characters of Dhanyamla, it was a cream colored liquid with strong sour smell and sour to taste. Details of physicochemical parameters are mentioned in Table-[2]. HPTLC profile of methanolic extract of Dhanyamla was done and details of number of spots and Rf value are given in Table-[3] and HPTLC profile is given in Photo 2 showing HPTLC: Densitogram at 254 nm and Photo 3 HPTLC: Densitogram at 366 nm.

Table 2 - Physico-chemical parameters of Dhanyamla

<table>
<thead>
<tr>
<th>No.</th>
<th>Analytical parameter</th>
<th>Dhanyamla</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Specific Gravity (5)</td>
<td>1.0033</td>
</tr>
<tr>
<td>2</td>
<td>pH (6)</td>
<td>3.257</td>
</tr>
<tr>
<td>3</td>
<td>Total solid content (7)</td>
<td>55.334</td>
</tr>
</tbody>
</table>

Analytical study of Dhanyamla has showed 14 spots and 20 spots at 254 nm and 366 nm respectively.

Table 3 - Rf Values of Dhanyamla

<table>
<thead>
<tr>
<th>Wavelength</th>
<th>No. of Spots</th>
<th>Rf values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short UV (254 nm)</td>
<td>14</td>
<td>0.05, 0.11, 0.14, 0.16, 0.20, 0.35, 0.36, 0.39, 0.44, 0.47, 0.50, 0.72, 0.89, 0.98</td>
</tr>
<tr>
<td>Long UV 366 nm</td>
<td>11</td>
<td>0.04, 0.11, 0.13, 0.20, 0.35, 0.36, 0.40, 0.44, 0.46, 0.50, 0.84</td>
</tr>
</tbody>
</table>

Discussion

Pharmacognosy study of Dhanyamla revealed starch content in it which was due to the grain ingredients like Tandula, Pruthuka, Kulattha, Laja, Kangubeeja, Kodrava, and Nagar which are rich sources of carbohydrates especially rice. It also showed presence of oil globules which was due to Nimbuka and Deepyaka. The presence of both carbohydrate and oil content in Dhanyamla would have been the reason of it having soothing and mild nourishing effect on using it externally. In the same time Dhanyamla as the name suggests and as mentioned earlier is a sour liquid i.e. amla or acidic due to the process of fermentation. This is clearly justified by the pH observed i.e. 3.25. Thus
because of this it has penetrating property which helps in cleansing of the blocked srotases also. The specific gravity of 1.0033 signifies that it is not a highly concentrated and viscous solution on physical examination. It is a watery non viscous solution as the ratio of water to other ingredients is large. It does not stick on the skin surface and flows like water itself. The HPTLC finger printing of Dhanyamla at 254 and 366 nm wavelengths was done to record and standardize the solution for future references. This study to a certain extent has helped in throwing light on understanding probable action of Dhanyamla in Diabetic polyneuropathy.

**Conclusion**

The Pharmacognostic study has showed presence of starch and oil globules in Dhanyamla signifying that the contents of the ingredients of Dhanyamla have been imparted to final fermented solution. Pharmaceutical study showed the acidic nature and other characteristics of the solution making it possible to understand how Dhanyamla might have worked on patients of Diabetic polyneuropathy. The results of this study may be used as a reference standard in further research undertakings of its kind.

**References**