ORIGINAL RESEARCH ARTICLE

Pharmacognostical and Pharmaceutical Evaluation of Ikshvaku churna (Lagenaria vulgaris Ser.) Fruit Pulp Powder

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ABSTRACT

Lagenaria vulgaris Ser. (Monila) Standly. (Ikshvaku) is an annular herbaceous climbing plant with a long history of medicinal uses for treatment of various ailments including Jaundice, Diabetes, Ulcer, Piles, Colitis, Asthma, Insanity, Hypertension, CCF, Skin disorders. Its fruit pulp is used both as an emetic and purgative. Based on classical Ayurvedic textual indications and recent pharmacological studies its fruit pulp powder was selected for studying its emetic effect clinically on Bronchial Asthma. Till date it has not yet been investigated scientifically hence, it was thought worth to study it in detail. The present paper highlights the pharmacognostical and phytochemical details and their role in laying down standardization and pharmacopoeial parameters. Pharmacognostical study shows fibers, annular vessels and calcium oxalate crystals. physicochemical parameters show total ash, acid insoluble ash 10.63 % w/w, alcohol soluble extractive value 46 % w/w. High performance Thin Layer Chromatography (HPTLC) study shows 9 spots in 254 nm.

Key words: Lagenaria vulgaris, Ikshvaku, Pharmacognosy, Phytochemistry.

INTRODUCTION

Herbal medicines are promising choice over modern synthetic drugs they show minimum or less side effects and considered to be safe. According to WHO survey 80% of the populations living in developing countries rely almost exclusively on traditional medicine for their primary health care and needs [1]. There exists plethora of knowledge & information and benefits of herbal drugs in our ancient literature of Ayurvedic medicine, one of the earliest treatiser of Indian medicine; the Charaka Samhita (1000 B.C.) mentions the use of over 2000 herbs for medicinal purposes. Revival of interest in Ayurveda there has been a phenomenal increase in the demand for specialized therapies of Ayurveda out of which Panchakarma presents a unique approach of Ayurveda with specially designed five procedures of internal purification of body through the nearest possible roots. Such purification allows the biological system to return to homeostasis & to rejuvenate rapidly and also facilitates the desired pharmaco-therapeutic effects of medicine administered thereafter [2]. Panchakarma has a full role of promotive, preventive and curative procedures. Out of the five procedures of Panchakarma Vamana or therapeutic emesis is the procedures of eliminating Kapha Dosha from the body through the upper passage by the vomatting. There are mainly six drugs i.e Catunaregam spinosa (Thunb) Tiruv-Madanphala, Luffa echinata Roxb.-Jeemutaka, Lagenaria vulgaris (Monila)standly- Ikshvaku, Luffa cylindrica (Linn.)-Dhamargava, Luffa acutangula (Linn) Roxb.-Krutvedhana, Holarrhena antidysentrica (Roxb. ex Flem) wall-Kutaja [3] recommended for therapeutic emesis in the form of different formulations in Charaka Kalpasthan [4].Out of these drugs Madanphala is most commonly used for the process of emesis but there are certain drugs which are specifically indicated for treatment of particular diseases e.g. Dhamargava in Anemia, Ikshvaku in Diabetes [5], Asthma & Dry cough [6]. So it is a need of time to prove the pharmacological actions of these drugs

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on particular disease with the help of modern tools of standardization. Hence, to provide standard parameter for the quality control of Ikshvaku pulp powder in Bronchial Asthma. The present study was carried out Pharmacognostical, pharmaceutical and phytochemical analysis of Lagenaria vulgaris (Monila) Standley for setting a preliminary profile for further references.

**Botanical Description of Plant** [7]:

*Lagenaria vulgaris (Monila)* Standley. Belonging to family cucurbitaceae, commonly known as Bitter bottle guard (Eng), Lauki (Hindi). It is a large pubescent, climbing or trailing herb with stout 5-angled hispid stems and bifid long tendrils. It found throughout the India either wild or cultivated. Leaves are long, petioled having 3-5 lobed, 7-10 or 10-12 cm. long. Fruits are 1-8 m large, bottle shaped with hard shell like epicarp when ripe. Seeds are numerous, long, white, smooth, 1.6-2 cm. long and horizontally compressed with marginal groove. Flowers are large white, solitary, monoecious. Seeds are many, obovate-oblong, white & compressed.

**MATERIALS AND METHODS**

**Pharmacognostical Evaluation** [8, 9]:

*Lagenaria vulgaris (Monila)* Standley fruit pulp powders were collected from the local farms of Chandrapur district, Maharashtra in the month of December-January. The fresh and semi-ripened fruits were cut into small pieces. The pulp obtained from fruits were shade dried & made into the coarse powder later the organoleptic and powder microscopy of fruit pulp powder was carried out at pharmacognosy department of I.P.G.T. & R.A. GAU, Jamnagar. For microscopic observation The fruit pulp powder was treated with small quantity of distilled water on the slide, and then it is again dried, ash value, water soluble extract, alcohol soluble extract and pH value were confirmed through the suitable tests.

**Qualitative tests:**

The methanol extract of the sample was analyzed for different functional groups. The presence of carbohydrate, phytosterol, saponin, tannins and flavonoid were confirmed through suitable tests.

**HPTLC:**

Methanol extract of *Lagenaria vulgaris* fruit pulp powder was spotted on pre coated silica gel GF 60254 aluminum plates by means of Camang Linomat V sample applicator fitted with a 100 µL Hamilton syringe. Chloroform: MeOH (9:1) was used as the mobile phase. After development densitometric scan was performed with a Camag T. L. C. scanner III in reflectance absorbance mode at U.V. detection as 254 nm and 366 nm under control of Win CATS Software (V 1.2.1. Camag). After completion of chromatographic procedure spraying of the plate was done with Anisaldehyde and the spots obtained were observed in day light.

**RESULTS**

**Pharmacognostical analysis:**

**Organoleptic characters:**

- Color: Light cream
- Odour: Pungent
- Taste: Bitter

**Microscopic Observations:**

Diagnostic characters under microscope are fibers (Fig 1), fragments of annular vessels (Fig 2), prismatic crystals of Calcium Oxalate (Fig 3), tannin (Fig 4), loosely arranged parenchymal cells (Fig 5), simple starch grains (Fig 6), spiral vessels (Fig 7), pitted scleroid (Fig 8), mesocarp cells (Fig 9)

**Pharmaceutical Analysis:**

*Lagenaria vulgaris (Monila)* Standley fruit pulp powder was analyzed using various standard physicochemical parameters at the Pharmaceutical chemistry lab. All the Pharmaceutical parameters such as loss on drying, ash value, water soluble extract, alcohol soluble extract and pH value were analyzed (Table 1).

**Phytochemical Analysis & HPTLC:**

**Qualitative tests:**

Presence of glycosides, flavonoid and tannins were confirmed through the suitable tests (Table 2).

**HPTLC:**

On analyzing under densitometer Track Shown 5 spots under 366nm with RF 0.01, 0.12, 0.20, 0.50, 0.90 and 9 spots were seen

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under 254nm with Rf 0.01, 0.09, 0.14, 0.18, 0.27, 0.50, 0.64, 0.73, 0.87 (Table 3).

**DISCUSSION**

Pharmacognosy study helps in authentication of the commonly used drugs through morphological, histological and physico-chemical parameters. This can prevent the accidental misuse of drugs and adulteration to a greater extent. In the present study the sample was proved to be genuine by assessing the pharmacognostical Parameters. Evaluation of physico-chemical parameters and qualitative analysis helps to identify the presence of specific ingredients in a sample and application of chromatographic techniques aid in recognition of number of ingredients and also to assess the purity by comparing with the standard ones. Refractive index procedure was not applicable to the churna so the same could not be assessed. pH is the measure of acidity or basicity of a solution. In the present sample pH was detected by using pH indicator paper and it was 6 showing the acidic nature of the solution. 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 10.4669 % w/w. Total ashes are designed to measure the total amount of material remaining after ignition. It includes both physiological (which is derived from the plant tissue itself) and non-physiological ash (residue of the extraneous matter likes and etc adhering to the plant substance) Ash value of *Lagenaria vulgaris* fruit pulp powder is 10.6304 %w/w. Water soluble extract & alcohol soluble extract is 49.12 % w/w & 46 % w/w respectively. 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. Identity of a compound is also possible by comparing it with the Rf value of a known compound. Here for the purpose of conducting TLC tracks were made having the sample ethyl acetate extract of *Lagenaria vulgaris* fruit pulp powder. After careful analysis and discussion with experts the mobile phase was fixed to be Toluene+Ethylacetate in the proportion of 7:3 respectively. The sample tracks and mobile phase remained the same for all the experiments related to TLC .The spots produced by TLC were observed in day light , short UV and long UV and Rf value was calculated . After completion of chromatographic procedure spraying of the plate was done with Anisaldehyde and the spots obtained were observed in day light.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Test</th>
<th>Result</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Aqueous Extractive</td>
<td>49.12 %w/w</td>
</tr>
<tr>
<td>2</td>
<td>Alcohol Extractive</td>
<td>46 %w/w</td>
</tr>
<tr>
<td>3</td>
<td>pH</td>
<td>6.0</td>
</tr>
<tr>
<td>4</td>
<td>Ash value</td>
<td>10.6304 % w/w</td>
</tr>
<tr>
<td>5</td>
<td>Loss on drying</td>
<td>10.4669 % w/w</td>
</tr>
</tbody>
</table>

**Table 3: HPTLC**

<table>
<thead>
<tr>
<th>SPOTS</th>
<th>R, Values at 254 nm</th>
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<tbody>
<tr>
<td>HPTLC</td>
<td>R, Values at 366 nm</td>
</tr>
<tr>
<td>9</td>
<td>0.01, 0.09, 0.14, 0.18, 0.27, 0.50, 0.64, 0.73, 0.87</td>
</tr>
<tr>
<td>5</td>
<td>0.01, 0.12, 0.20, 0.50, 0.90</td>
</tr>
</tbody>
</table>

**Microphotographs:**

**Fig 1: Fibre**

**Fig 2: Fragments of Annular vessels**

**Fig 3: Prismatic crystal of Calcium Oxylate**

**Fig 4: Tannin content**
CONCLUSION

Identified phytochemical components content in the present sample i.e., tannins have highly antioxidant & anti-inflammatory function [9], saponin shows steroidal aglycone structure with antibacterial & adjuvant property [10], phytosterol promise in allergies and stress related illness [11], flavonoids are antioxidant, anti-inflammatory, anti-allergic relives hay fever, eczema, sinusitis [12]. All this support the intended action of the given sample in management of Bronchial Asthma. It is inferred that the given sample meets minimum qualitative standards as prescribed by API at preliminary level. The results of this study may be used as the reference standard in further research undertakings of its kind.

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