

Research Article

Standardisation of Ayurvedic Polyherbal Formulation,
Pancasama ChurnaAjay Kr Meena^{1*}, M M Rao¹, P Panda, Kiran², Ajay Yadav², Uttam Singh² and B Singh¹National Institute of Ayurvedic Pharmaceutical Research, Patiala – 147001, Punjab, (India)²School of Pharmaceutical Sciences, Shobhit University, Meerut, UP**ABSTARCT**

Ayurvedic medicine, Pancasama Churna known to be effective mainly on gastrointestinal tract (GIT), has been standardized by following modern scientific quality control procedures both for the raw material and the finished product. Pancasama Churna was subjected to macro-microscopic, Physico-chemical, preliminary phytochemical, TLC and HPTLC to fix the quality standards of this drug. This study results a set of diagnostic characters essential for its standardisation. TLC and HPTLC fingerprinting were employed to fix standards. The values obtained after physicochemical parameters study showed that these values should be helpful to develop new pharmacopoeial standards. This will be helpful to overcome batch to batch variations in traditional preparation of Pancasama churna. The physicochemical constituents found to be present in raw material used for the preparation of Pancasama churna possibly facilitate the desirable therapeutic efficacy of the medicinal formulation.

KEYWORDS: Pancasama Churna, Phytochemical studies, Ayurvedic Drug.

INTRODUCTION

Churna is a fine powder of a drug or drugs which is prepared by mixing clean, finely powdered and sieved drugs. Pancasama churna shows its effects mainly on gastrointestinal tract. It increases peristaltic movements of GI tract. It is used as antifatulent (admana), antirheumatic (amavata). It is also used in the treatment of abdominal disorders (udara roga), pain (sula) and in treatment of piles (arsa).

Practitioners usually do the identification of different herbs used in Pancasama churna according to Ayurvedic parameters. The preparation of Pancasama churna is based on traditional methods in accordance with the procedures given in classical texts [1]. Due to lack of modern pharmacopoeial standards laid down and followed for processing of Pancasama churna, the medicine prepared using traditional methods may not have the desired quality and batch to batch consistency. Hence this formulation required standardization of following scientific parameters including organoleptic characters, chemical analysis, chromatographic pattern and microbial screening. The work was undertaken in trust as part of a programme of testing and validation of traditional practice of using the Ayurvedic medicine Pancasama churna in management of admana. Some standards already exist for Pancasama churna. However, the work deals with the details of following latest standardization guidelines involving Good Manufacturing Practices (GMP) for preparation of Ayurvedic

medicines. Standardization guidelines to be followed for herbal products provided by international bodies like World Health Organization (WHO), European Agency for the evaluation of Medicinal Products (EMA) and United States Pharmacopoeia (USP) have also been considered.

Table 1. Pancasama churna contains following ingredients:

| Sanskrit name | Scientific name | Part Used | Quantity |
|---------------|---------------------------------|-----------|----------|
| Mustha | <i>Cyprus Rotundus L.</i> | (Rizomes) | 1 part |
| Haritaki | <i>Terminalia chebula Retz.</i> | (plant) | 1part |
| Pippali | <i>Piper longum Linn.</i> | (Fruit) | 1 part |
| Trivart | <i>Operculina turpethum L.</i> | (Root) | 1 part |
| Sandha lavana | - | - | - |

MATERIALS AND METHODS

Plant material was collected from NIAPR, Patiala. The authenticity of the species of herbs was checked and confirmed. For microscopical study, properly washed plant material was cut in to desirable size. Free hand sections were taken and stained with phoroglucinol and HCL. [2] Physico-chemical studies like total ash, water soluble ash, acid insoluble ash, water and alcohol soluble extract, loss on drying at 105°C, heavy metals and successive extractive values by soxhlet extraction method were carried out as per the WHO guide lines [3].

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Pancasama Curna

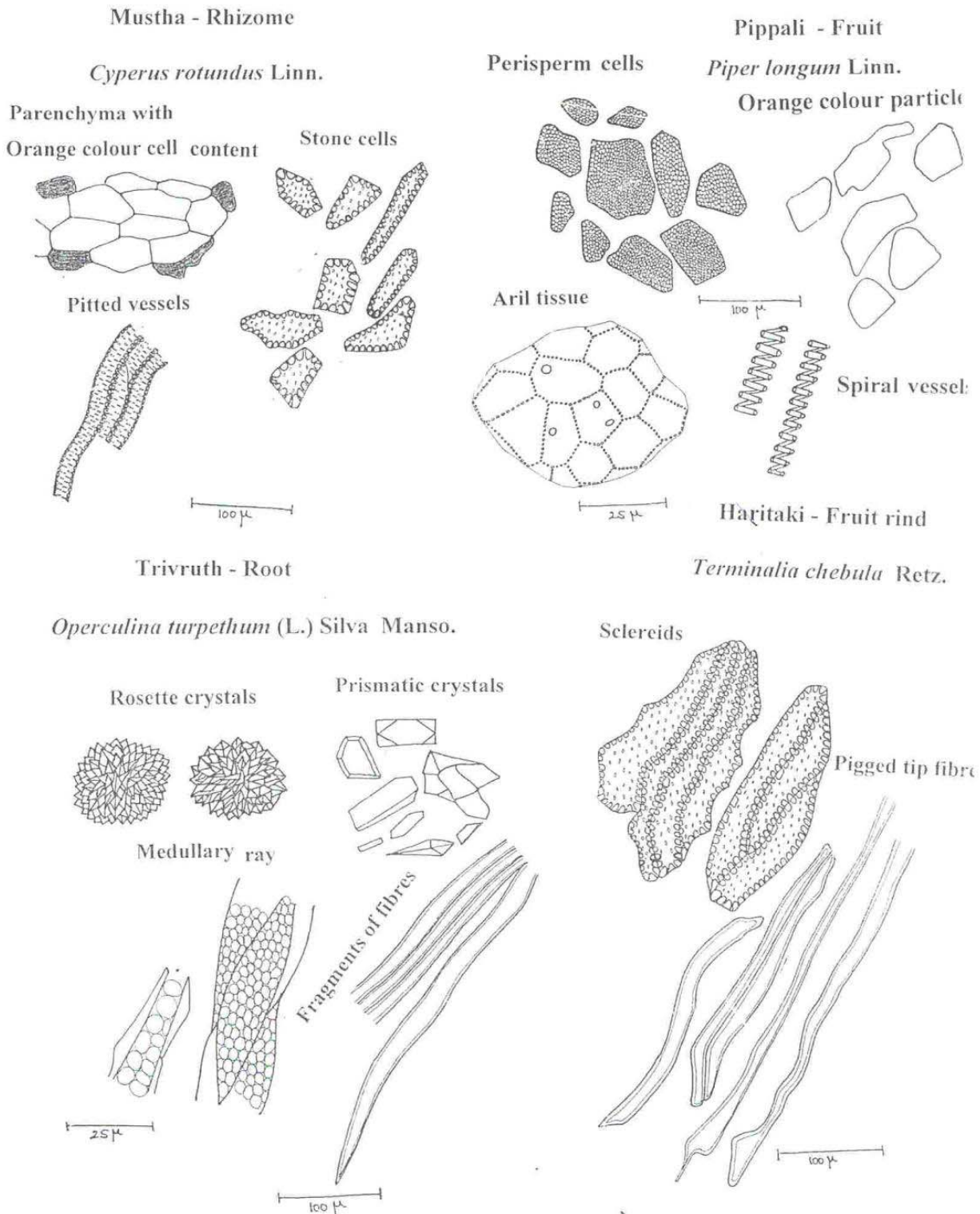


Figure 1. Microscopy of Pancasama Churna

Preliminary phytochemical tests were performed as per the standard methods^[4]. The HPTLC finger print profile of ethanolic extract of Pancasama churna was taken on aluminium plate coated with silica gel 60 F₂₅₄ of 0.2 mm thickness (E. Merck) as adsorbent and employing CAMAG Linomat IV applicator^[5, 6]. The mobile phase used was Toluene: Ethyl acetate: Formic acid (5.0:3.5:1.0 v/v). The plate was dried and visualised

under UV 254 nm and 366 nm. The plate was dipped in Vanillin- Sulphuric acid and heated at 105 °C till the spots appeared^[7, 8].

RESULT AND DISCUSSIONS

Sample of raw material was examined for probable adulterants such as plant material of similar appearance which were found to be absent.

Table 2. Physico-chemical parameters of Pancasama churna

| S. No | Parameters | Mean value (%w/w) n=3 |
|-------|--|-----------------------|
| 1 | Loss on drying at 105°C (%w/w) | 8.30 |
| 2 | Total ash (%w/w) | 23.50 |
| 3 | Acid-insoluble ash (%w/w) | 3.52 |
| 4 | Water soluble extractive value (%w/w) | 37.62 |
| 5 | Alcohol soluble extractive value(%w/w) | 21.14 |
| 6 | pH value (10% aqueous solution) | 4.65 |
| 7 | Sodium | 15 |
| 8 | Total viable aerobic count | 1.4x10 ⁶ |
| 9 | Total Enterobacteriaceae | Nil |
| 10 | Total fungal count | Nil |

Macroscopical characters: Pale brown, moderately fine powder; odour pungent; taste slightly pungent with tingling sensation.

Microscopic characters: A few mg of powder was washed with plain water, treated with iodine and potassium iodide, drop of glycerine was added and mounted. It showed the characters like orange coloured Parenchymatous cells, stone cells (6-8 μ), aril tissue, perisperm cells, vessels with spiral thickening up to 75 μ in length, spiral thickening up to 75 μ in length, rosette and prismatic crystals of calcium oxalate, biseriata and multiseriate medullary ray, lignified sclereids and orange coloured particles [9, 10].

Physio-chemical study

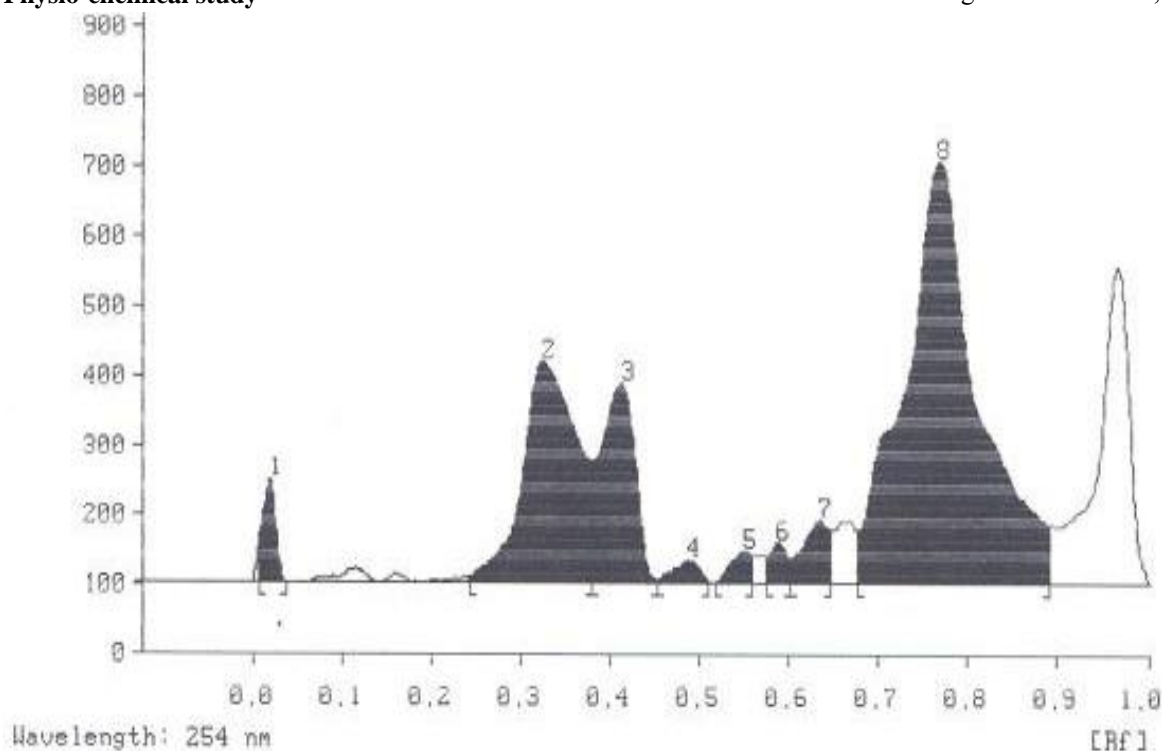


Figure. 2. HPTLC Finger print of Pancasama Churna at 254 nm

Physio-chemical parameters of Pancasama churna are tabulated in (Table-2). Deterioration time of the plant material depends upon the amount of water present in plant material. If the water content is high, the plant can be easily deteriorated due to fungus. The loss on drying at 105°C in Pancasama churna was found to be 8.30 %. Total ash value of plant material indicated the amount of minerals and earthy materials present in the plant material. Analytical results showed total ash value of 23.50 %. The amount of acid-insoluble siliceous matter present in the plant was 3.52 %. The water-soluble extractive value indicated the presence of sugar, acids and inorganic compounds. The alcohol soluble extractive values indicated the presence of polar constituents like phenols, alkaloids, steroids, glycosides, flavonoids and n-hexane (hot) extractive values indicate the non-polar secondary metabolites present in the plant.

TLC/ HPTLC Analysis: TLC and HPTLC finger printing profile of Pancasama Churna were developed in Toluene: Ethyl acetate: Formic acid (5.0:3.5:1.0 v/v) solvent system. Under 254 nm, it showed 3 spots with R_f value of 0.33, 0.41 and 0.78 (all green colour); under 366nm it showed 5 spots with R_f value of 0.33 (blue), 0.41 (blue), 0.69 (pale blue), 0.75 (pale blue), 0.89 (pale blue). After derivatization with the vanillin and sulphuric acid it showed 6 spots with R_f value: 0.50 (grey colour), 0.58 (grey colour), 0.69 (blue), 0.72 (grey), 0.83 (bluish grey) and 0.88 (grey).

CONCLUSION

Morphology as well as various phamacognostic aspects of the sample was studied and along with phytochemical, physio-chemical, TLC and HPTLC studies. Pancasama churna exhibits a set of diagnostic characters, which may

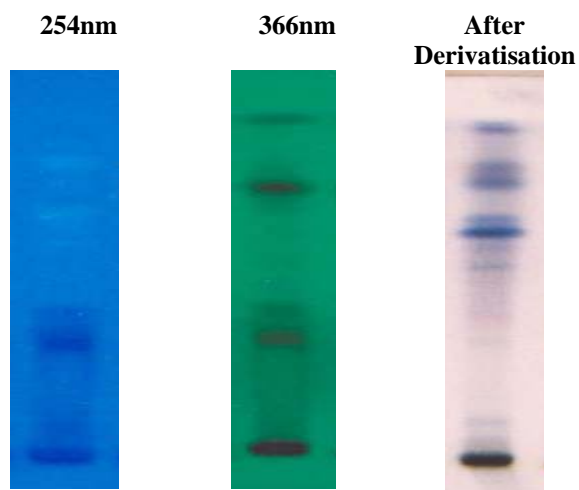


Figure 3. Thin layer chromatography of Pancasama Churna (Toluene: Ethyl acetate : Formic acid :: 5.0 : 3.5 : 1.0 v/v)

help in identifying the drug in dried condition.

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