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Pharmacognostical and Pharmaceutical Evaluation of Panchakoladi Churna: An Appetizer for Undernutrition in Children

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Abstract

Background: Adequate nutrition plays a major role in proper growth and development of the children. Undernutrition in children is a major public health problem in India. Deepana- Pachana (enhancement of digestive power) is a first line treatment for indigestion. Restoration of the digestive power and metabolic function is the priority in children with Kumarashosha (undernutrition). Panchakola Churna along with Katuki is recommended for oral administration in children to enhance the digestive power. Panchakola Churna is an established standardized drug in Ayurveda which is used for adults. It is essential to standardize this modification with addition of Katuki which is used specifically in children. This article highlights the pharmacognostical and pharmaceutical evaluation of Panchakoladi Churna which is mentioned in Ashtanga Hridaya, Uttarasthana. **Aim and Objective:** To evaluate and establish pharmacognostical and physio-chemical analysis of Panchakola Churna with addition of Katuki. **Materials and Methods**: Raw drugs were procured and formulation is prepared in the Pharmacy of Institute. Authentication, analysis of organoleptic parameters and microscopic evaluation of the powder was done at Pharmacognosy Department of ITRA Jamnagar. **Result:** Observed parameters were analysed with Ayurvedic Pharmacopoeia of India (API) standards and were consistent with reference standards. In physiochemical properties, loss on drying (LOD) was 8.14% w/w, total ash value of 7.13 % w/w, water-soluble extract of 14.5% w/w, methanol-soluble extract of 9.1% w/w and with a pH value of 5.9. **Conclusion:** Panchakola Churna with addition of Katuki is consistent with API standards and reliable to use in paediatrics than Panchakola Churna.

Keywords: Katuki, Panchakoladi Churna, Pharmacognosy, Pharmaceutical, Undernutrition.

INTRODUCTION

Under consideration of global burden of nutritional disorder, burning issue nationally it requires an alarming level of attention for undernutrition in children. WHO described malnutrition as a current global burning issue with many adverse effects on growth and development.[1] Malnutrition includes undernutrition and overnutrition as well. Undernutrition has multifactorial origin and a disorder of insufficient intake, impaired absorption and excess nutrient loss which prioritize the need of correction of digestion. Karshya is a disease where aggravated Vata responsible for the pathophysiology and which require nourishing therapy.[2] Unlike Karshya, Kumarashosha in children is characterized by obstruction

of channels of circulation leads to recurrent respiratory and gastrointestinal symptoms and leads to gradual emaciation.[3] This requires stepwise treatment in accordance with the pathophysiology. Deepana-Pachana (enhancement of digestive power) is the first line of management and plays a pivotal role in this condition. Panchakola Churna along with Katuki is recommended in medicine at initial phases.[4] This can clear the metabolic obstructions and improve the absorption. This has specific indication to cure the loss of appetite. Panchakola Churna is a standardized formulation as an appetizer which is widely used in adult in Ayurveda. It is need of current era to establish this modification with addition of Katuki along with Panchakola Churna explained specifically for children. This might be a consideration of the gut of child, tolerability and vulnerability. The basic analysis of this combined formulation has not been evaluated till now. This work deals with the analysis of Panchakola Churna with addition of Katuki Churna which is recommended for undernourished children to enhance the digestive power and comparison with Panchakola Churna which is established in previous researches. [5,6]

Materials & methods

Raw drugs (Panchakola along with Katuki) was procured from the Pharmacy of Institute. Panchakola Churna is a combination of Pippali, Pippali Moola, Chavya, Chitraka and Sunti. Each are taken in equal proportions. Dried fruit of Pippali (Piper longum Linn), Dried root of Pippali Mula (Piper longum Linn) and Chitraka (Plumbago zeylanica Linn), Dried stem of Chavya (Piper retrofactum Vahl.) and dried rhizome of Sunti (Zingiber officinale Rosc.) and Katuki (Picrorhiza kurroa Royle ex Benth) are used for preparing the Churna formulation.

The formulation is prepared in the pharmacy of institute. Equal proportions of all the ingredients collected, cleaned, dried & powdered separately. It is passed through sieve no 85 separately to make fine powder.

Analysis of characters

The qualitative assessment is done as organoleptic study, to check the identity and purity. The sensory evaluations are done characteristics i.e. colour, taste, odour, touch, and appearance of the sample is assessed. [6]

The diagnostic confirmatory characters of the drugs were performed to check the authenticity through powder microscopy under Carl Zeiss microscope. Each ingredient identity is confirmed and adulterations are ruled out.[7] The details are shown in figure 1.

Pharmaceutical evaluation was performed to assess the quality, consistency etc. Standard parameters like loss on drying, total ash values, extractive values (Acid and water) and pH was evaluated. Moisture content, solubility and stability is assessed through these parameters.

Result

It showed dark brown colour, pungent and astringent taste, mild pungent smell, not smooth or rough on touch, powdery in appearance. Microscopic analysis showed stone cells, mesocarp cells, oil globule - oleoresin and black debris of Pippali. Pitted vessels, annular vessels and starch grains of Pippalimoola. Starch grains and fibres of Chavya. Brown content, cork cells with tannin, scleroid and stone cells of Chitraka. Annular vessels, fibres, starch grains of Shunti and pitted vessels of Katuki. Loss on drying showed 8.14 %, total ash of 7.13%, water soluble and acid soluble extracts of 14.5% and 9.1% respectively. The observed pH value was 5.9.

Discussion

Panchakola Churna is an established standardized powder formulation used as an appetizer in Ayurveda. Researches showed the analytical parameter as well as the clinical efficacy. [8,9,10] It is indicated in diseases of gastrointestinal tract or that arise due to Ama (indigestion). Charaka Samhita specifies the relief of colic pain with use of Panchakola. Kumarashosha is a paediatric specific disease which is associated with undernutrition which require stagewise treatment rather than a mere nourishment. Unlike the common causes of undernutrition like nutritional inadequacy, here the aggravated Kapha obstruct the Rasavaha Srotas (first tissue channel) leads to frequent respiratory and gastrointestinal symptoms and gradual undernutrition in children. As a first line management Acharya recommended to administer Panchakola Churna along with Katuki. Panchakola Churna is pungent in taste, hot in potency and relieves Kapha, Vata Dosha, in turn clear the channels of the body. By considering the potency it is not usually administered in disease which is associated with Pitta or Rakta conditions. This directs the cautious administration of the same in the paediatrics. The specific action of Panchakola Churna with addition of Katuki in children can be thus attributed to the special action of Katuki. Katuki have antioxidant, anti-cancerous, and hepatoprotective actions.[11] It is a mild purgative which can even support to break the pathophysiology of Kumarasosha in children.

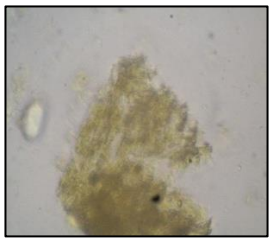
The difference of dark brown colour, astringent and pungent taste of this combined formulation is because of the addition of Katuki.[12,13] Loss on drying indicates the moisture content and volatile principles in a formulation thus determine the quality and stability. Here LOD is 8.14% w/w shows that the formulation is stable. Low LOD when compared to Panchakola Churna implies the stability, and better shelf life which make it less prone to microbial contamination which is better for children. Slight reduction in LOD could be due to the less moisture content of Katuki. Total Ash value is the inorganic residue and gives the mineral content or impurities as well. The total Ash value is 7.13 %w/w and acceptable purity is thus determined. The Panchakoladi Churna shows lower ash value when compared with the Panchakola Churna suggest reduced levels of inorganic compounds. Water soluble extract indicates better bioavailability. Alcohol soluble extractive value indicates the extraction of therapeutically active organic compounds. Water soluble extract is 14.5 %w/w and alcohol soluble extract is 9.1 %w/w. Bitter glycosides (picrosides) and resinous, iridoid contents respectively might showed the increase in values and better bioavailability. Mild acidic pH of the formulation indicates the compatibility and better stability reduced risk of irritation. The research works on the analysis of Trikatu, Panchakola Churna and Shadushana with addition of Maricha are available. Considering the tolerability and vulnerability of children, addition of Katuki in Panchakola Churna as per classical reference serves better in terms of pharmacognostical and pharmaceutical analysis thereby providing essential baseline information prior to further efficacy trials.

Conclusion

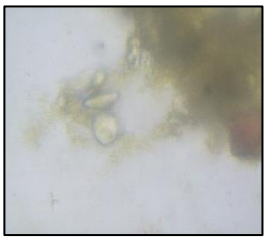
This study evaluated the pharmacognostical and pharmaceutical analysis of Panchakola Churna with addition of Katuki. The macroscopic, microscopic and physiochemical parameters were recorded and were in accordance with the reference API standards. Pharmacognostical and pharmaceutical analysis of Panchakola Churna when added with Katuki (Picrorhiza kurroa) which cure loss of appetite is reliable in children when compared to standard Panchakola Churna. This will be further helpful in development of formulation in terms of its efficacy. This formulation is specifically mentioned to cure the loss of appetite in children.

Figure 1: Microscopic view of Panchakoladi Churna

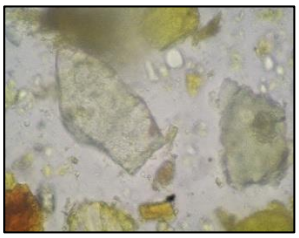
Stone cells of Pippali



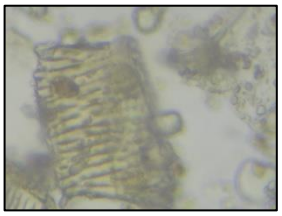
Mesocarp cells of Pippali



Oil globule and oleoresin of Pippali

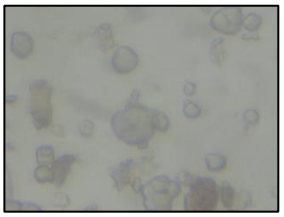


Black debris of Pippali

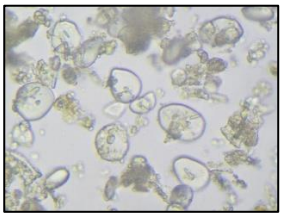


Pitted vessels of Pippalimoola

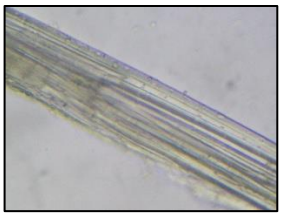
Annular vessels of Pippalimoola



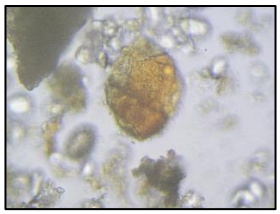
Starch grains of Pippalimoola



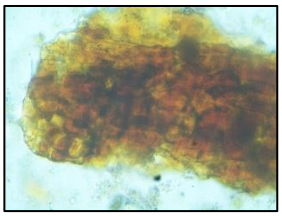
Starch grains of Chavya



Fibres of Chavya

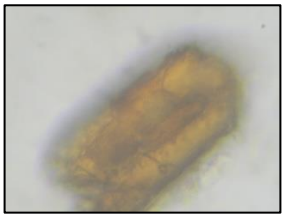


Brown content of Chitraka

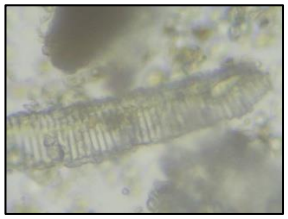


Cork cells with tannin of Chitraka

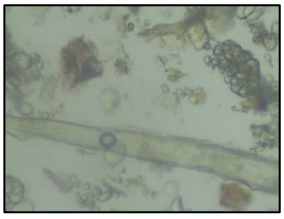
Scleroid of Chitraka



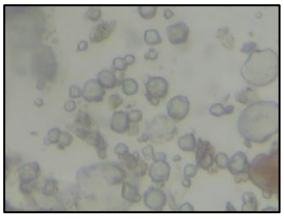
Stone cells of Chitraka



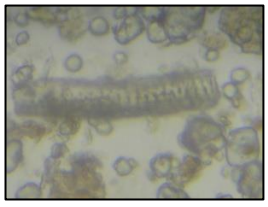
Annular vessels of Shunti



Fibres of Shunti



Starch grains of Shunti



Pitted vessels of Katuki

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