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INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY EDUCATIONAL RESEARCH
ISSN:2277-7881(Print); IMPACT FACTOR :10.16(2026); IC VALUE:5.16; ISI VALUE:2.286
PEER REVIEWED AND REFEREED INTERNATIONAL JOURNAL
(Fulfilled Suggests Parameters of UGC by IJMER)
Volume:15, Issue:1(7), January 2026
Scopus Review ID: A2B96D3ACF3FEA2A
Article Received: Reviewed: Accepted
Publisher: Sucharitha Publication, India
Online Copy of Article Publication Available: www.ijmer.in

STANDARDIZATION OF PATHYADI CHURNA – A POLY HERBAL FORMULATION

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Abstract

Pathyadi churna known to be effective in GI disorders. Standardization of herbal formulations is essential to assess the quality of the drugs based on the concentration of its active principles. Here an attempt made to standardize the Pathyadi Churna on the basis of physico-chemical, phytochemical organoleptic properties, fluorescence analysis, TLC evaluation. The values obtained after physico-chemical parameters showed that these values should be helpful to develop new pharmacopeial standards. The phytochemical constituents found in the raw material used for the preparation of Pathyadi Churna have desired therapeutic efficacy of the formulation. Set parameters were found sufficient to evaluate the studied Pathyadi Churna and can be used as standard reference for the quality control and assurance purpose.

Key words: Standardization, Polyherbal formulation, Pathyadi Churna

Introduction

Churna Kalpana (powder preparation) belongs to Panchavidha kashaya kalpana, upakalpana of Kalka Kapana[1]. Pathyadi churna is one of the powder formulation, prepared by mixing powder of three ingredients viz. Haritaki (*Terminaliachebula Retz)*, Pippali (*Piper longum linn)* and Sauvarchala Lavana (*Black Salt*). It is mainly indicated in the management of Agnimandya (loss of digestive power), Ajeerna (Indigestion) and Adhmana (flatulence). It helps to normalise the Agni as it is having Deepana, Pachana (Appetizer) and Anulomana (mild laxative) action. Its therapeutic dose is 1 to 3 masha (1-3g), administered along with Dadhijala or Takra (buttermilk) or Ushnajala (hot water).[2]

Therapeutic properties of Terminalia chebula are Antibacterial, Antifungal, Antiviral, Antioxidant, Anticarcinogenic, Antiulcerogenic, Antidiabetic, Cytoprotective, Cardioprotective, Wound healing, Purgative, Immunomodulatory and Ant-amoebic activity.[3]

Therapeutic properties of Piper longum are Anti-microbial, Anti-inflammatory, Immunomodulatory, Antidiabetic, Anticancer, Antioxidant, Analgesic, Anti-depressant, Hepatoprotective and Antiulcer activity.[4]

The Souvarchalalavan is having sukshma, ushna, laghu, ruchivardhaka gunas. It relives vibhandha. It is easily digestible, good for heart, aromatic, purifies belching, pungent at end of digestion, kindles digestion and gives taste[5].

The production of potent formulations using genuine drug is primary requirement for success of Indian system of medicine in order to achieve their objectives of protection of health and eradication of disease. Recent implementation of GMP properly emphasizes the reorientation of drug standardization in the field of Indian medicine especially in pharmaceutical aspects which is proved to be foundation of potential drug formulation.

There is almost need for conducting studies in order to standardize the various aspects like processing and stages involved in the preparation of drug formulation as described in classics. So here, an attempt was made to standardize the Pathyadi churna- A poly herbal formulation.

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Materials and Methods

Materials

Plant Material

Pathyadichurna consists of 3 ingredients, viz., *Terminaliachebula, Piper longum, Sauvarchalalavana (Black salt).*
All these ingredients were procured from GMP certified KLE Ayurveda Pharmacy, Karnataka, India, and were authenticated in AYUSH approved drug testing laboratory, KLE Shri. B.M.K.Ayurveda Mahavidyalaya Belgaum, Karnataka.

The study was conducted in Department of Bhaishajya Kalpana, KLEU' Shri.B.M.K.Ayurveda Mahavidyalaya. Belgaum.

Method of Preparation

Ingredients:

Name	Botanical name	Part used	Quantity	Chemical composition
Haritaki[6]	*Terminalia chebula* Retz	Fruit carp[7]	1 Part	Chebulinic acid, tannic acid, terchebin
Pippali[8]	*Piper longum* Linn.	Fruit[9]	1 Part	Piperine, caryophyllene
SauvarchalaLavana	*Black Salt*	------	1 Part	Nacl, Kcl

Procedure:

- Preparation of fine powder of herbal drugs:

  After proper identification and quality assessment of the Haritaki and Pippali (dry), drugs are taken separately, pounded well in pounding machine and sieved through shifter having 120 number mesh. Fine powder was collected separately.

- Preparation of fine powder of lavana:

  Sauvarchala lavana was pounded in a stony mortar and is passed through shifter having 120 mesh numbers to obtain fine powder. Fine powder was collected.

- Preparation of Pathyadi churna[10]:

  All three fine powders as per specified quantity were taken in a mortar, triturated till a homogeneous compound mixture prepared. The obtained yield was 1500gm.

Table No.. Showing the weight observation of pharmaceutical preparation of Pathyadichurna

SI.No	Name of ingredients	Quantity Taken	Weight Loss
1	Haritaki	1000gms	500 gms
2	Pippali	1000gms	420 gms
3	Sauvarchala Lavana	1000gms	30 gms

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Results

Table.1. Physico-chemical evaluation of Pathyadi churna

Tests	Haritaki	Pippali	Pathyadi churna
Foreign matter	Nil	Nil	Nil
Ash Value	4.687% w/w	6.792%w/w	15.8w/w
Acid Insoluble Ash	1.421% w/w	0.396%w/w	3.41w/w
Water soluble Ash	1.00%w/w	3.00%w/w	5.20w/w
Alcoholic Extract	43.6%	6.20%	23.27%
Aqueous extract	62.00%	32.40%	83.18%
pH	----------	---------- --	4.04

Table.2. Phyto-chemical analysis of inorganic constituents of pathyadi churna

Test	Haritaki	Pippali	Pathyadi churna
Ca	Negative	Negative	Negative
Mg	Negative	Negative	Negative
Na	Positive	Positive	Positive
K	Negative	Negative	Positive
Fe	Positive	Positive	Positive
Sulphates	Negative	Positive	Negative
Carbonates	Positive	Positive	Negative

Table.3 Phyto-chemical analysis of organic constituents of Pathyadi churna

Tests	Haritaki	Pippali	Pathyadi churna
Carbohydrates	Positive	Positive	Negative
Reducing Sugar	Positive	Positive	Negative
Monosaccharide's	Positive	Positive	Negative
Pentose Sugar	Positive	Negative	Positive
Non Reducing Sugar	Negative	Negative	Positive
Proteins	Positive	Negative	Positive
Amino acids	Negative	Negative	Positive
Steroids	Positive	Positive	Negative
Alkaloids	Positive	Positive	Positive
Tannins and Phenolic compounds	Positive	Positive	Positive

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Table.4. Organoleptic and Physical characters of Pathyadi churna

Tests	Haritaki	Pippali	Pathyadi churna
Odor	characteristic	characteristic	Characteristic
Touch	Smooth	Smooth	Smooth
Colour	Greenish	Dark Brown	Light green
Taste	Astringent	Pungent	Astringent
MLT	----------	----------	Under normal limit as per IP
pH	----------	----------	4.04
Tap density	----------	----------	0.69gm/cc
Bulk density	----------	----------	0.45gm/cc
Carr's Index	----------	----------	34.78
Hauser's Ratio	---------	--------	53.33
Angle of Repose	----------	--------	0.0127
Particle size	120 microns	120microns	120 microns

Table.5. Showing the analysis of Flame photometry.

Tests	Results of Sauvarchala Lavana	Results of Pathyadi churna
Sodium	40.60%	17.06%
Potassium	0.19%	0.04 %

Table.6. Showing results of Fluorescence analysis of Pathyadi churna

Sample and reagent	UV light under 254nm	UV light under 366nm	Visible light
Pathyadi churna	Light green	Dark brown	Light green
Powder + 1N NaOH	Dark green	Black	Dark brown
Powder + Picric acid	Dark green	Dark brown	Light green
Powder + Acetic acid	Dark green	Dark violet	Green
Powder + 1N HCL	Light green	Dark violet	Green
Powder + 1N HNO3	Dark green	Dark violet	Green
Powder + Iodine 5%	Dark green	Dark violet	Green
Powder + 5% Fecl3	Black	Dark brown	Black
Powder + 1N NaOH in Methanol	Dark green	Dark brown	Brown
Powder + Methanol	Dark green	Dark brown	Dark green
Powder + 50% HNO3	Dark green	Dark brown	Light green

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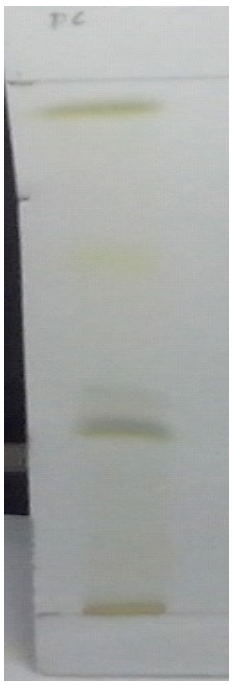
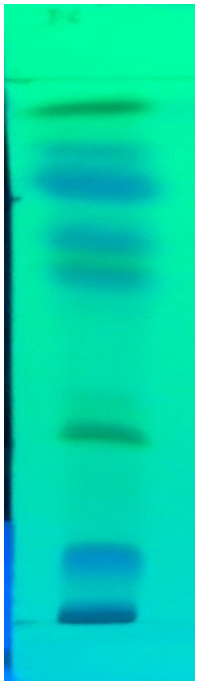
Image.1. Showing results of Thin layer chromatography of Pathyadi churna



254 nm



366nm

Discussion:

Raw drugs when subjected for processing it was noted that there was considerable weight loss in haritaki because of fibrous nature of drug; same was with pippali due to volatile nature and minimal weight loss for sauvarchala lavan as manual handling.

Physico-chemical study showed individual ingredients congregate with API standards confirming the drug are genuine. On contrast an increase in ash values and water extracts when compared to individual ingredients suggesting that the formulation has new standards and values might have changed due to its ratio and relativity of contents. Alcoholic extract of haritaki was 43.6% but formulation came up with 23% for the reason that the haritaki was 1/3rd part formulation, were as water soluble ash was 1% w/w and 3% w/w in individual churna but mixture of sauvarchala lavana augmented the formulations value.

pH of formulation was also noted as parameter and it documented 4.04 emphasizing that it is acidic and substantiating why it should be given with buttermilk and indicated in conditions of decreased appetite , indigestion etc.

Phytochemical analysis of inorganic elements

Elements likeCa, Mg, sulphates and Carbonates were negative {absent} in formulation while other elements like Na and Fe were present {poistive] as they were present in individual powder flame photometry also confirming the presence of Na and K K was positive since the lavan was added. Also Na which actually holds two water molecule and according to Ayurveda its told its increases kleda, relives vibhanda due anulomna property since rukshaguna is believed to cause it . K

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is intracellular and due to presence of this in extracellular path acts faster to get in cells than Na because of this possibly acting as quick appetizer.

Organoleptic and physical characters Odour was characteristic and texture was smooth while colour and taste were greenish and astringent respectively nearing the blend of haritaki.

Tikta rasa being foremost in agnideepana confirming its deepana property. Particle size of formulation was 120 microns on stage microscope it's told that finer the particle size greater surface area and faster the absorption.

The powder was also analysed with different solutions under 254 nm UV light were it was noticed as dark to light green colour and under 366 nm it was dark brown and violent colour. And under visible light it was light to dark green colour

The TLC of Pathyadi churna were developed by using water, ethyl acetate and toluene as a solvent system in the ratio 5:3:1. Rf values obtained in 366nm are 0.03, 0.15, 0.37, 0.38, 0.45, 0.97 and in 254nm are 0.03, 0.15, 0.37, 0.38, 0.45, 0.97, 0.67, 0.72, 0.83, 0.8 and 0.97.

Conclusion

The Pathyadi Churna was evaluated depending upon various parameters. The results obtained was found to be within standards. The preliminary tests can be prescribed as standards to fix the quality control tests for the Pathyadi Churna and can be used in routine analysis of the same. This can also be used to perform quality control and quality assurance in the laboratory of Ayurvedic pharmaceuticals.

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