International Journal of Pharmaceutical Research and Applications
Volume 7, Issue 2 Mar-Apr 2022, pp: 1387-1391 www.ijprajournal.com ISSN: 2456-4494

Pharmaceutico- Analytical Study of Pathyadi Churna

Nikhil Neelakandhan. E. U[1], Shailesh Deshpande[2], Basil[3]
1. PhD scholar, Dept. of kayachikitsa, Parul Institute of Ayurved, Waghodia& Assistant Professor, Vishnu Ayurveda College, Shoranur
2. Professor, Department of Kayachikitsa, Parul Institute of Ayurveda, Parul University, Waghodia
3. Head, Department of Chemistry, CARekeralam, Koratty, Thrissur Dist.

Submitted: 05-04-2022 Accepted: 19-04-2022

ABSTRACT
Pathyadi Churna is a Herbo-Mineral preparation mentioned in Chakradutta, which is indicated in all types of Ajeerna like Ama, Vidagdha, Vishtabdha and Rasasesha.Pathya, Pippali and Souvarchala lavana are the ingredients of the preparation. pH, LOD, Ash values, Water and Alcohol soluble extracts were observed. Ash value was little high due to the high presence of Souvarchala lavana. HPTLC were done to find out the presence of constituents like Gallic acid and Piperine. Presence of heavy metals were within the limits. Presence of Alkaloids and Phenols were also observed. These helps to suggest the probable mode of action of the drug in Ajeerna. (Dyspepsia)
Key words: Pathyadi Churna, Organoleptic analysis, phytochemical analysis, Pathya, Pippali, Souvarchala lavana.

I. INTRODUCTION

The technique or procedure used to convert and facilitate the raw material substances to edible and potent formulation is called pharmaceutics[1]. The prepared formulation can be used internally or externally based on the site of disease or manifestation of disease[2]. Ayurveda defines Churna as the powdered form of dry drugs[3]. Raja and Kshoda are the synonyms of Churna[4]. Churna is an easy form of medicine to prepare. These forms of drugs are easy to digest and because of that, the result will be very fast. Pathyadi Churna is a herbo-mineral formulation mentioned in the classical texts like Chakradutta[5] and Bhaishajya Ratnavali[6].

II. OBJECTIVES

To collect literary data and material data from authentic sources and prepare Pathyadi Churna as per the classical texts and to analyze the prepared Churna organoleptically and chemically.

III. MATERIALS AND METHODS

The literary details of the drugs were collected from the authentic classical textbooks like Chakradutta and Bhaishajya Ratnavali. The ingredients are listed in Table no:1 and their ratio/proportion is mentioned in Table no:2.

Sources of Data

The certified raw drugs prescribed in the formulation were collected from Ancheri Drugs, Nehru bazar, Thrissur. The drug identification were conducted at DravyagunaVijnana department, Vishnu Ayurveda College, Shoranur. The organoleptic study of the prepared drug were conducted at Rasa Sasthra and Bhaishajya Kalpana Department, Vishnu Ayurveda college. The pharmaceutical study were conducted in CARekeralam, KINFRA park, Thrissur.

Method of preparation

Pathyadi Churna was prepared with 1:1:1 ratio of Pathya, Pippali and Sauvarchala lavana. Each drugs were finely powdered with the help of machines separately and taken in the above said ratio and mixed together thoroughly.

OBSERVATIONS

Organoleptic changes observed after the thorough mixing of the ingredients. Due to cleaning and powdering procedure, there were quantitative loss of the ingredients.

Table 1: Showing the Ingredients of Pathyadi Churna

Sl No:	Ingredient	Botanical Name	Quantity purchased
1	Pathya	Terminalia chebula	5 kg
2	Pippali	Piper longum	5 kg
3	Sauvarchala lavana	Black salt	5 kg

International Journal of Pharmaceutical Research and Applications
Volume 7, Issue 2 Mar-Apr 2022, pp: 1387-1391 www.ijprajournal.com ISSN: 2456-4494

Table 2: Ratio of Ingredients

Sl No:	Ingredient	Quantity used to prepare final drug	Parts/ proportion
1	Pathya	4.4 kg	1
2	Pippali	4.4 kg	1
3	Sauvarchala lavana	4.4 kg	1

Table 3: Organoleptic changes of Pathyadi Churna

Sl No:	Organoleptic character	Observation
1	Colour	Greenish brown
2	Consistency	Fine powder
3	Odour	Smell of pippli
4	Taste	Salty bitter

IV. RESULTS

Organoleptic Analysis

The organoleptic features of Pathyadi Churnais depicted in Table no: 4

Table 4: Organoleptic features

Sl No:	**Organoleptic character**	**Observation**
1	Colour	Greenish brown
2	Consistency	Fine powder
3	Odour	Hard boiled egg smell (sulpher smell)
4	Taste	Salty & mild bitter

Physico- Chemical analytical Study

The results of standardization parameters of Pathyadi Churnaare mentioned in Table 5.

Table 5: Results of Standardization parameter

Parameters	**Unit**	**Result**	**Test Method**
pH (10% aqueous solution)	-	4.31	API Part I Vol I
Loss on Drying	%	4.39	API Part I Vol I
Total Ash	%	36.29	IP 2018
Acid Insoluble Ash	%	0.33	IP 2018
Water Soluble Extract	%	59.12	IP 2018
Alcohol Soluble Extract	%	33.40	IP 2018
Sodium	%	13.86	AOAC 21st Edition 2019
Potassium	%	1.07	AOAC 21st Edition 2019
Calcium	%	1.09	AOAC 21st Edition 2019

The results of the HPTLC conducted for Pathyadi Churna is listed in Table 6.

Table 6: HPTLC of Pathyadi Churna

Parameters	**Unit**	**Result**	**Test Method**
Gallic Acid	%	0.15	CKL/ANL/HPTLC-001
Piperine	%	0.38	CKL/ANL/HPTLC-001

International Journal of Pharmaceutical Research and Applications
Volume 7, Issue 2 Mar-Apr 2022, pp: 1387-1391 www.ijprajournal.com ISSN: 2456-4494

Results of the Heavy metal analysis in Pathyadi Churna is listed in Table 7.

Table 7: heavy metals in Pathyadi Churna

Heavy Metals	Unit	Result	Specification	Detection limit	Test method
Arsenic	Mg/kg	0.19	NMT 3.0	0.05	CKL/ANL/AY- 008
Cadmium	Mg/kg	BDL	NMT 0.3	0.05	CKL/ANL/AY- 008
Lead	Mg/kg	0.35	NMT 10.0	0.05	CKL/ANL/AY- 008
Mercury	Mg/kg	Not detected	NMT 1.0	0.05	CKL/ANL/AY- 008

Results of Phytochemical screening is listed in Table 8.

Table 8: Phytochemical screening of Pathyadi Churna

Phytochemicals	Result	Test method
Alkaloids	Present	Dragendroff's reagent test
Flavonoids	Absent	Shinoda test
Phenol	Present	Folinciocalteu phenol reagent test
Tannins	Present	Ferric chloride test

The quantification of the phytochemicals in Pathyadi Churna is listed in Table 9.

Table 9: Quantification of Phytochemicals in Pathyadi Churna

Quantification of phytochemicals	Unit	Result	Test method
Alkaloids	%	0.88	Experimental Phyto-Pharmacognosy
Phenol	%	8.27	CKL/ANL/UV-002
Tannins	%	7.39	CCRAS 40.3

V. DISCUSSION

The ingredients of Pathyadi Churna like Pathya (Terminalia chebula), Pippali (Piper longum) and Souvarchala lavana (Black salt) were purchased 5 kg each and after cleaning and drying in sunlight, the quantity of Pippali reduced to 3.9 kg and after powdering each drug, the quantity of Pippali reduced to 3.5 kg. So, each drug were taken 3.5 kg and the total drug prepared were 10.5 kg.

A) Organoleptic Characters

Colour: The colour of the Pathyadi Churna was greenish brown. The colour of Pathya was pale brown, Pippali was greyish black and Souvarchala lavana was pinkish grey.

Odour: Pathyadi Churna has a characteristic smell of hard boiled egg due to the high presence of Souvarchala lavana (Black salt). 1/3rd of the Pathyadi Churna is Souvarchala lavana. Sulphur present in the Black salt/Souvarchala lavana gives the distinct smell[7].

Taste: The taste of Pathyadi Churna is salty with a little bitter taste. Salty taste is due to the high presence of Black salt/Souvarchala lavana and bitter taste is due to Pathya (Terminalia chebula). Mild numbness of tongue will appear after the consumption due to the effect of Pippali.

Consistency: After mixing, the herbo- mineral preparation is a very fine powder.

B) Physico-Chemical Parameters

pH:

pH value indicates the acidic nature or Basic/alkaline nature of a compound. pH less than 7 indicates the acidic nature, pH of 7 indicates neutral and pH of greater than 7 indicates the basic/alkaline nature. The pH of Pathyadi Churna is 4.31. its mild acidic in nature. This will help to promote digestion[8]. For the given sample of Pathyadi Churna, the pH was found out with 10% aquas solution and the method used was from API Part I- Vol I.

Loss on drying[9]:

Determination of both water and volatile contents of the drug were done. This indicates the moisture content in the drug. Loss on Drying (LOD) of Pathyadi Churna is found that 4.39%.

International Journal of Pharmaceutical Research and Applications
Volume 7, Issue 2 Mar-Apr 2022, pp: 1387-1391 www.ijprajournal.com ISSN: 2456-4494

higher the moisture content, more will be the percentage of Loss on Drying (LOD). The higher value is suggestive of more amount of moisture content and the preparation is more susceptible to spoilage[10]. The test method adopted from API Part I- Vol I.

Total Ash:

The total ash of the sample Pathyadi Churna is 36.29%. the high ash value is due to the high mineral contents in the formulation[11]. As 33.33% of the Pathyadi Churna is composed of Souvarchala lavana/Black salt, the high Ash value is justifiable. The test method adopted was from IP-2018.

Acid Insoluble Ash:

The acid insoluble ash is a measure of the sandy matter and plant body parts like calyx, leaves etc. which contain higher content of non-combustible acid insoluble matter[12]. The Acid Insoluble Ash value of Pathyadi Churna is 0.33% which is within the limits.

Water Soluble Extracts:

Water soluble extract values plays an important role in the evaluation of crude drug. Less extractive values indicates addition of exhausted materials, adulteration or incorrect processing during drying or storage or formulating[13]. The water Soluble Extract value of Pathyadi Churna is found to be 59.12%. the test method adopted was from IP- 2018.

Alcohol Soluble Extract:

The Alcohol Soluble Extract value using IP- 2018 test method of Pathyadi Churna was 33.40%. the Alcohol Soluble Extract value also indicates the same purpose as the Water Soluble Extract value. The less extractive value of Pathyadi Churna indicates addition of exhausted materials, adulteration or incorrect processing during drying or storage or formulating[14].

Sodium:

The percentage of Sodium in Pathyadi Churna is 13.86%. the presence of sodium is due to the Souvarchala lavana[15]. The method adopted to find the percentage of Sodium was taken from AOAC 21st edition 2019.

Potassium:

The percentage of Potassium in Pathyadi Churna is 1.07% which is due to Souvarchala lavana[16]. The test method was adopted from AOAC 21st edition 2019.

Calcium:

The percentage of calcium in Pathyadi Churna is 1.09%. the presence is mainly due to the Souvarchala lavana[17]. The test method adopted from AOAC 21st edition 2019.

Chromatography:

Suitable chromatography adopted was HPTLC (High Performance Thin Layer Chromatography). HPTLC of Pathyadi Churna revealed the active principles like Gallic acid and Piperine. 0.15% of Gallic acid and 0.38% of Piperine were present in the formulation. These active principles may be helping the drug to do its pharmacological actions.

Heavy Metal Analysis:

CKL/ANY/AY-008 method was used to analyze the presence the Heavy metals in Pathyadi Churna. The minimum detection limit of Heavy metals in the method was 0.05mg/kg. the normal range of Arsenic should be Not more than(NMT) 3.0mg/kg and it was 0.19mg/kg in the given sample. The presence of cadmium in the sample was BDL (Below the Detection Limit). Normally the presence od Cadmium should be not more than 0.3mg/kg. Lead was found to be 0.35mg/kg in the given sample. The normal value is not more than 10.0 mg.kg. normal value or Mercury is not more than 1.0mg/kg and here, in this sample, Mercury was not detected.

Phytochemical Screening:

Presence of Alkaloids were detected in the sample using Dragendroff's reagent test. By conducting Shinoda test, it is found that Flavanoids were absent in the given sample of Pathyadi Churna. Phenols were detected in the Pathyadi Churna using Folinciocalteu phenol reagent test. The presence of tannins in Pathyadi Churna were detected using Ferric chloride test.

Quantification of Phytochemicals:

Experimental phyto pharmacognosy revealed that the given sample of Pathyadi Churna contains 0.88% of Alkaloids. 8.27% of phenols were present in the given sample when inhouse method of CKL/ANL/UV-002 conducted. 7.39% of Tannins were detected in the Pathyadi Churna. The test method used were CCRAS 40.3.

VI. CONCLUSION

Pathyadi Churna is a fine powder indicated in digestive disorders like Ajeerna. The formulation is mild acidic in nature and the total ash value is slightly high due to the high presence of Black salt in it. The active contents like Gallic acid, Piperine helps to promote digestion. Alkaloids in the formulation have anti bacterial and anti viral effects[18]. The phenols/Phenolic acid promote anti-

International Journal of Pharmaceutical Research and Applications
Volume 7, Issue 2 Mar-Apr 2022, pp: 1387-1391 www.ijprajournal.com ISSN: 2456-4494

inflammatory capacity of humans[19].The Tannins in the formulation have anti microbial activities which will also help to promote digestion[20]. So, overall, this formulation can correct digestive disorders including microbial origin.

BIBILIOGRAPHY

[1]. Rohithkrishnan GB, Prashanth BK,Nayana N. Pharmaceutico-analytical study of Sahacharaditaila and its 7 Avarti. Ayurpharm Int J Ayur Alli Sci. 2015;4(9):161-167.
[2]. Rohithkrishnan GB, Prashanth BK,Nayana N. Pharmaceutico-analytical study of Sahacharaditaila and its 7 Avarti. Ayurpharm Int J Ayur Alli Sci. 2015;4(9):161-167.
[3]. Pandit ParasurAmaSastri, sarangadhara, Sarangadhara Samhita, 1st Reprint, New Delhi, Chaukhamba publications, 2013, 178p.
[4]. Pandit ParasurAmaSastri, sarangadhara, Sarangadhara Samhita, 1st Reprint, New Delhi, Chaukhamba publications, 2013, 178p.
[5]. ShyAmala, Chakrapanidatta, ChakradattaChikitsasarasangraha, 1st edition, Thrissur, Samrat publishers, 2014, 115p
[6]. Kanjiv Lochan, GovindaDasji, Bhaishajyaratnavali, reprint 2016, New Delhi, Chaukhamba publications, 2016, 637p
[7]. https://www.webmd.com/diet/health-benefits-black-salt#1 dated 15/03/2022
[8]. https://medlineplus.gov/ency/article/003883.htm#:~:text=The%20normal%20volume%20of%20the,acidic%20(1.5%2to%203.5).dated15/03/2022
[9]. Anonymous, The Ayurvedic Pharmacopeia of India, Vol 2. 1st edition, New Delhi: Govt of India, Ministery of Health and Family Welfare, Dept. of Ayush; 2007.141p.
[10]. Rohithkrishnan GB, Prashanth BK,
[11]. Nayana N. Pharmaceutico-analytical study of Sahacharaditaila and its 7 Avarti. Ayurpharm Int J Ayur Alli Sci. 2015;4(9):161-167.
[12]. Ajazuddin, Saraf S. Evaluation of physicochemical and phytochemical properties of Safoof-E-Sana, a Unani polyherbal formulation. Pharmacognosy Res. 2010;2(5):318-322. doi:10.4103/0974-8490.72332
[13]. https://egyankosh.ac.in/bitstream/123456789/43418/1/Experiment-14.pdf dated 15/03/2022
[14]. Chandel HS, Pathak AK, Tailang M. Standardization of some herbal antidiabetic drugs in polyherbal formulation. Pharmacognosy Res. 2011;3(1):49-56. doi:10.4103/0974-8490.79116
[15]. Chandel HS, Pathak AK, Tailang M. Standardization of some herbal antidiabetic drugs in polyherbal formulation. Pharmacognosy Res. 2011;3(1):49-56. doi:10.4103/0974-8490.79116
[16]. https://www.webmd.com/diet/health-benefits-black-salt#1dated:15/03/2022
[17]. https://www.webmd.com/diet/health-benefits-black-salt#1dated:15/03/2022
[18]. https://www.webmd.com/diet/health-benefits-black-salt#1dated:15/03/2022
[19]. Qiu S, Sun H, Zhang AH, Xu HY, Yan GL, Han Y, Wang XJ. Natural alkaloids: basic aspects, biological roles, and future perspectives. Chin J Nat Med. 2014 Jun;12(6):401-6. doi: 10.1016/S1875-5364(14)60063-7. PMID: 24969519.
[20]. Kumar N, Goel N. Phenolic acids: Natural versatile molecules with promising therapeutic applications. Biotechnol Rep (Amst). 2019;24:e00370. Published 2019 Aug 20. doi:10.1016/j.btre.2019.e00370
[21]. Chung KT, Wong TY, Wei CI, Huang YW, Lin Y. Tannins and human health: a review. Crit Rev Food Sci Nutr. 1998 Aug;38(6):421-64. doi: 10.1080/10408699891274273. PMID: 9759559.